THE LEVEL OF SERVICE INVENTORY (ONTARIO REVISION) SCALE VALIDATION FOR GENDER AND ETHNICITY: ADDRESSING RELIABILITY AND PREDICTIVE VALIDITY

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ABSTRACT

Previous investigations of the Level of Service Inventory – Ontario Revision (LSI-OR) have examined individual subgroups of offenders (e.g., women, Aboriginal offenders), which has made comparisons of its predictive validity between specific offender groups suspect. This study was conducted on a complete cohort of 26,450 offenders who were released from Ontario provincial correctional facilities, sentenced to a conditional sentence, or who began a term of probation in 2004. Participants were followed up for at least four years to collect recidivism information on numerous subgroups of offenders including males (81.7%), females (18.3%), Aboriginal (6.4%), Black (7.3%) and Caucasian offenders (59.2%). Analyses revealed that the LSI-OR scores are positively correlated with recidivism ($r = .441$, $p < .001$), and similar correlations were found for all offenders regardless of gender or race, (Aboriginal $r = .377$, $p < .001$; Black, $r = .420$, $p < .001$; Caucasian, $r = .417$, $p < .001$; Male, $r = .439$, $p < .001$; Female, $r = .426$, $p < .001$). LSI-OR scores are also correlated with severity of the recidivism offence, ($r = .098$, $p < .001$) indicating that higher LSI-OR scores are related to higher offence severity for all ethnicities, sentence types, and genders. These findings indicate that the LSI-OR is an effective risk assessment tool for use among different ethnicities, sentence types and genders for provincially sentenced offenders in Ontario.

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1.0 INTRODUCTION

In Canada, the Federal and Provincial Governments share the responsibility of providing offenders sentenced to a term of incarceration with secure housing, reliable assessment, and effective correctional programming and/or treatment. Inmates, who are sentenced to a term of two years or more, fall under the Correctional Service of Canada's (CSC) responsibility. Provincial corrections, on the other hand, are responsible for the other offenders who receive shorter sentences, are put on probation, community service, or have been remanded (Statistics Canada, 1998).

With over 27,000 offenders released from provincial institutions, placed on a conditional sentence or sentenced to a term of probation each year in the province of Ontario, ensuring that these individuals are properly assessed is an important social concern. As such, one of the central tasks of both Provincial and Federal corrections is to ensure that the offenders' risk levels are appropriately determined. In the criminal justice system, risk assessment is the process of predicting whether an offender will reoffend in the future (Andrews & Bonta, 2010). However, the process is not simply the task of predicting recidivism. Although risk assessment involves directly assessing and estimating the level of risk in order to predict recidivism, it is not limited to the prediction of reoffence. There are many facets of risk assessment and different risk assessment instruments can have different goals; from determining the immediate risk an offender poses to oneself and others, to helping assessors design long-term treatment goals (Andrews & Bonta, 2010; Olver, Stockdale & Wormith, 2009; Rettinger & Andrews, 2010; Latessa & Lovins, 2010).

Reliable and valid risk assessment tools help correctional agencies to predict the level of risk an offender poses to the community (Latessa & Lovins, 2010). In addition, some of the more recent risk assessment tools can highlight the appropriate targets for change in these offenders. As such, this has become one of the primary mandates of the Canadian criminal justice system. Although risk assessments take time and resources to complete, the costs are generally well accepted based on the long term benefits associated with using risk assessment tools (Latessa & Lovins, 2010).

Jones, Johnson, Latessa and Travis (1999) conducted a national survey of probation and parole officers in the United States where almost all of the respondents agreed that not only was offender risk assessment a necessary part of their jobs, but it also made their jobs easier, helped

to create a more professional environment, helped staff make better decisions, increased the effectiveness of service delivery and enhanced fairness in decision making (Latessa & Lovins, 2010). Using a reliable and valid risk assessment tool is just one step in conducting evidence based interventions and adhering to best practices. However, as Latessa and Lovins (2010) point out, it is a necessary step in order to ensure that services are targeting the appropriate needs, for the right offenders.

In addition to determining offenders' risk of reoffence, risk assessment tools are often used to inform security placement, improve utilization of resources, identify risk and need factors to inform treatment, and influence decision making by providing information in a systematic manner, reduce bias by following an objective criteria and enhance public safety (Latessa & Lovins, 2010; Walters, 2009). In fact, before a parole decision is made in Ontario, all offenders being considered for early release must be subjected to a standardized risk assessment for review by the parole board (Statistics Canada, 1998).

In Canada, risk assessment varies between the provincial and territorial jurisdictions and between the adult and young offender jurisdictions. In the United States, risk assessment is also used in varying levels from State to State. Some of the uses include pre-trial, probation, parole, community corrections and prisons. In addition, the courts also utilize risk assessments in order to assist on bond, pre-trial and sentencing decisions, and during revocation hearings. In probation and parole, risk assessments are used for decisions regarding levels of supervision and program placements. Parole boards use risk assessment to inform release decisions. Finally, prisons and jails utilize criminal risk assessment for inmate classification, program placement and in making decisions regarding early release (Latessa & Lovins, 2010).

The numerous uses for risk assessments in the criminal justice system highlight the importance of ensuring that these tools are both reliable and valid. False negatives, where risk is underestimated, could lead to early release or inadequate supervision that may ultimately lead to that offender committing a more serious offence. False positives, where risk is overestimated, can also present a serious problem by keeping someone incarcerated, or by increasing their supervision when it is unnecessary; keeping the individual from being able to participate freely in society (Bloom, Owen & Covington, 2005).

Criminal risk assessment is a delicate practice, as it involves estimating the probability of a future event based on indicator variables (Hanson, 2009). The "risk" being assessed is the

probability that one will reoffend, and is not simply based on the crime committed (Latessa & Lovins, 2010). Risk assessment involves an uncertainty about a person's risk on which assessors must make a judgement. It is impossible to make the right decision one hundred percent of the time, but the best risk assessment tools should limit the range of speculation (Hanson, 2009). This again speaks to the importance of performing valid and reliable risk assessments, both for the benefit of the offender and society as a whole. Bloom et al. (2005) argue that the appropriate measure for an offender would depend on the type of error that would be more acceptable in that particular case. For example, one instrument might be more acceptable when assessing risk to reoffend upon release into the community, and a second instrument might be more appropriate when determining what type of security an offender should be placed in while incarcerated. Although there have been a number of types of risk assessments available for assessors, Hanson believes that there is still room for improvement (2009).

1.1. History of Risk Assessment

Early risk assessment was performed by clinicians. These decisions were based primarily on interviews and the clinician's intuition; offenders were labelled as being "high" or "low" risk to reoffend (Hanson, 2009; Harris, Rice & Cormier, 2002; Holsinger, Lowenkamp & Latessa, 2006). In the beginning, this professional judgement was given primary importance in criminal risk assessment. However, this method was not very reliable and studies have shown that clinicians' unstructured assessments were not significantly better than non-professionals when predicting criminal reoffence (Harris et al., 2002; Quinsey & Ambtman, 1979). In fact, Monahan (1981) found that forensic clinicians were incorrect twice as often as they were correct in their assessments of risk. Over-prediction of violence by clinicians was common (Steadman & Cocozza, 1974). These problems surrounding a purely clinical method prompted the development of more structured assessment methods. Soon, the poorly predictive method of unstructured professional opinion was replaced by more accurate and structured risk assessment tools (Hanson, 2009).

Since 1954 or earlier, statistical methods of assessment have been accepted by some as more accurate than the previous methods of assessment (Harris et al., 2002). However, despite flaws in clinical judgement, the importance of risk assessment instruments in the criminal justice system did not truly take flight until the 1980s. At this time there was a dramatic increase in the acceptability of risk assessment instruments, particularly the actuarial risk-needs assessments

(Fass, Heilbrun, Dematteo & Fretz, 2008). This development began when many policy makers and researchers became sceptical of the ability of mental health experts to assess risk (Hanson, 2009). During this time, many reviews emerged stating that violent risk assessment which relied on clinical judgement was "doomed" (see, Monahan, 1976; Hanson, 2009). As such, this method became widely criticized due to the unstructured nature of these professional opinions; neither the risk factors nor the combination of the risk factors were considered before clinical opinions were formed (Hanson, 2009). It was soon believed that in order to advance risk assessment for crime prediction, evaluations of psychologically meaningful causal risk factors was required (Hanson, 2009). This prompted a shift towards the use of empirically based risk assessments and classification tools. These tools were now able to provide a more effective and efficient way to conduct risk assessment as they are based on empirically tested risk factors, and as such, their accuracy is significantly better than those derived from clinical judgements (Hanson, 2009).

Prior to the 1990s, risk assessments were often made on a dichotomy: offenders were labelled as either dangerous or not dangerous (Pozzulo, Bennell & Forth, 2006). There have since been a number of improvements in classification, and now assessments are presented with multiple levels of risk (such as, very high/high/medium/low/very low). In addition, a number of specific risk assessment measures have arisen to predict certain types of recidivism (such as violent or sexual; Pozzulo et al., 2006). However, some of these instruments are more reliable than others. Bloom, Webster, Hucker and DeFreitas (2005) cited a number of guidelines that they believe are necessary for the successful development of an actuarial risk assessment tool: it must be specific to the risky behaviour being studied; key risk factors should be highlighted and their relevance explained; there should be a direct link to risk management practices; it must agree with an existing test or standard; and finally, it should be both informed and focused. They also state that any actuarial information that can be obtained through records should be explored, since this information can assist in focusing and strengthening the risk assessments (Bloom et al., 2005).

Warren et al., (2005) have suggested that the most efficient way to develop an assessment of risk is to facilitate the development of the scale, contribute theoretical and construct classification, identify causes, and provide strategies for intervention when deemed necessary. The creation of an appropriate actuarial risk assessment tool is an extensive process that must include cross validation, often taking approximately 10 years from beginning to end. Despite this

lengthy process, numerous methods of risk assessment have been developed and validated. There have also been a number of advances in risk assessment, which includes a greater accuracy for predicting criminality in women. This development is particularly noteworthy since there has not been a great deal of studies conducted on females in the past, as males tend to be over-represented in both prisons and forensic hospitals (Warren et al., 2005).

Over the years, a number of different tools have emerged and been incorporated as an essential part of correctional placement, treatment, and interventions (Fass et al., 2008). Some researchers and clinicians continue to favour the unstructured clinical risk evaluation; however, the majority are now recommending that standardized risk assessments are included in risk evaluation (Kroner, Stadtland, Eidt & Nedopil, 2007). The inclusion of these structured risk assessment instruments are favoured because of their ability to draw on a combination of historical and clinical risk factors (Kroner et al., 2007).

It is important to test the predictive accuracy of these risk assessment tools in any population that they might be used. As such, these instruments are under constant review and development. As a result of this ongoing process, the risk assessment tools used in the criminal justice system have improved considerably over the past two decades (Hanson, 2009). The predictive accuracy of numerous risk assessment instruments have been tested internationally, allowing for a number of additional advancements to forensic risk assessments (Kroner et al., 2007).

As a result of this ongoing process of research and revisions, risk assessment can be classified as belonging to one of four generations. Although this generational model originally developed historically, with each generation adding to (or expanding on) the generation before, tools in each generation continue to emerge as one generation of risk assessment tool might be more beneficial than another based on the specific needs. Furthermore, despite the number of tools that have emerged over the years, there has never been an overall consensus on what constructs should best be assessed, or the best method to combine all of the risk factors to effectively evaluate risk (Hanson, 2009).

1.1.2. The Four Generations of Risk Assessment

Several "generations" of risk assessment have been described in the literature (Andrews, Bonta & Wormith, 2006). The first generation was unstructured and relied on professional clinical judgement to determine the likelihood of recidivism. As mentioned previously, this type

of risk assessment is now believed to be unreliable and inaccurate (Grove & Meehl, 1996). As such, risk assessment has moved towards more structured, evidence based approaches (Olver et al., 2009).

The second generation of risk assessment became more standardized by incorporating actuarial risk factors that had been developed through empirically derived static (unchanging) risk factors that were shown to accurately predict reoffence. Although the second generation risk assessment procedures were believed to have a clear advantage over the first generation, they still had little influence over psychological risk assessments (Hanson, 2009). The content of these scales were not believed to be psychological in nature or reflect psychological constructs. The risk factors included in these tools were purely based on the empirical associations with recidivism. They were typically composed of items routinely collected in the correctional system, such as offence history and offender demographics, without any concern for psychometric or behavioural theory (Hanson, 2009). Thus, these second generation tools did not receive a great deal of attention outside of the criminal justice system. Although these tools were found to better predict reoffence than the first generation, they were not able to track change resulting from treatment.

Hanson (2009) credits Dr. Robert Hare for leading the way into the third generation of risk assessment with his concept of psychopathy. This psychological construct, when used in the prediction of crime and violence, attracted the attention of the larger psychological community (Hanson, 2009). This risk assessment tool was the Psychopathy Checklist-Revised (PCL-R; Hare, 1980). The PCL-R, and other third generation tools, first incorporated dynamic risk factors that were derived from theoretical assumptions. This generation has also been referred to as "Risk Management" because of its incorporation of offenders' needs. These tools included a structured clinical assessment which focused on risk factors in an attempt to manage individual cases, rather than just to perform predictions.

Offender needs were further classified as either related to criminality (criminogenic) or not related to criminality (non-criminogenic). It was believed that by using criminogenic needs in risk assessment instruments, they would be able to inform treatment decisions in addition to increasing the accuracy of predicting recidivism. These upgrades allowed for offender progress to be tracked (Tanasichuk & Wormith, 2009). However, some have argued that risk factors are not necessary causal factors, thus, the management of these factors does not necessarily

influence the outcome of whether one recidivates or not (Nilsson, Munthe, Gustavson & Anckarsater, 2009). It was not until the 1990s that these the third generation tools actually became popular in correctional risk assessment. At this time a number of structured violent risk assessment tools were introduced; including: the Historical Clinical Risk-20 (HCR-20; Webster, Douglas, Eaves, & Hart, 1997) and the Sexual Violence Risk-20 (SVR-20; Boer, Hart, Kropp, & Webster, 1997). A number of these third generation instruments continue to be used in corrections today.

The fourth generation of risk assessment built upon the third generation, allowing for case conceptualization by considering the individual offender. Assessors were now able to look into individual strengths and weaknesses, using the assessment tools to help develop a treatment plan. An example of a fourth generation risk assessment tool is the Level of Service Inventory-Ontario Revision (LSI-OR; Andrews, Bonta, & Wormith, 1995), which is currently used in Ontario provincial corrections. This type of risk assessment, like the other generations, has also met with several criticisms. Some argue that clinical judgement would be more relevant when accessing availability of acceptance and support upon release, as this could have a profound effect on one's outcome. However, this is often difficult to assess pre-release and thus, would not really add to the predictive ability of a risk assessment tool (Nilsson et al., 2009).

Although these "generations" were developed chronologically, there are some criticisms regarding classifying them in a generational model. This overview is not meant to be taken as a history and does not reflect the natural progression or evolution of risk assessment technology. Instead, the generations are meant to act as a heuristic. For example, the Static 99 is an example of a second generation risk assessment tool that was developed after many third and fourth generation tools.

Since there are a number of different uses for risk assessment tools, researchers are constantly developing and refining risk assessment tools within each generation. For example, if one would like to quickly assess an offender upon intake for whether or not he posed a threat to himself or other inmates, a short and easy-to-complete second generation risk assessment might be the most practical tool. However, if a probation officer would like to assess the strengths and weaknesses of his client in order to develop a treatment plan, a more detailed fourth generation tool might be the most practical. Therefore, one generation should not automatically be

considered superior to the others; instead, the best tool for each circumstance should depend on what type of risk is being assessed, and what the outcome will be used for.

1.1.3. Static and Dynamic Risk Factors

Risk factors are often divided into two different dimensions, static risk factors and dynamic risk factors. These risk factors should be highly correlated with recidivism in order to be appropriate predictors. Static risk factors are fixed aspects of an offender's history that cannot be changed or improved. Some examples are criminal history, instructional misconduct, presence of psychopathy, age, and drug abuse history (Andrews & Bonta, 2010; Fass et al., 2008). The second generation risk assessment items were entirely static in nature. These are factors that cannot change over time and through actuarial assessments they have been shown to be strong predictors of criminal behaviour (Andrews & Bonta, 1998). However, although they are strong predictors, a risk assessment tool based on static items is problematic because of the inability to account for change over time.

Dynamic risk factors, on the other hand, are offender characteristics that can change over time. The third generation of risk assessment began with the accompaniment of dynamic risk items in the assessment tools. These items can include criminal peers, current substance abuse and criminal attitudes. Items such as these dynamic risk factors have demonstrated a strong relationship with criminal offending behaviour. Dynamic risk factors are also referred to as criminogenic needs and should be the target of intervention. Since these factors can be changed, it is expected that targeting them through treatment can reduce recidivism. Dynamic risk factors are particularly beneficial in corrections because they can be targeted and tracked, allowing researchers and clinicians to track the changes as a result of treatment (Fass et al., 2008).

Craig, Browne, Stringer and Beech (2005) believe that by targeting these dynamic factors and criminogenic needs, intervention is possible; with the appropriate treatment, these individuals would become less of a threat to society. Some recent research has demonstrated positive results emerging from targeting the dynamic risk factors (Fass et al., 2008). The inclusion of these dynamic factors is what separates the second generation of risk assessment from the third (Fass et al., 2008). The second generation was primarily focused on the static factors, where the third generation includes dynamic factors that have been proven through theory and evidence (Fass et al., 2008).

1.2. Utility of Criminal Risk Assessment

There are several different forms of risk assessment tools which can be predictive for certain crimes and designated time frames (Nilsson et al., 2009). Some tools are designed to promote public safety, where others are more offender focused and can be used to formulate recommendations for services, identify risk factors to be targeted in treatment and intervention, or reveal responsivity issues that may influence the treatment process (Olver, Stockdale & Wormith, 2009). There are also risk assessment tools intended for immediate assessment of the potential harm to the self and others. Suicide risk, for example, is assessed using actuarial risk factors (historical) in combination with current psychiatric status (such as current suicidal ideation and depression). Immediate risk for violence towards others can also be assessed in the same way (Nilsson et al., 2009).

Although there are a number of different situations where a risk assessment tool might be used, there are also a number of criticisms related to the utility of criminal risk assessment. It is criticized that most research on recidivism has looked at groups rather than individuals. Many researchers look into the number of "failures", or groups of individuals who have relapsed, while ignoring the individual or allowing for identification of the individuals who actually do relapse (Nilsson et al., 2009). Further, Nilsson et al. (2009) believe that actuarial risk assessment instruments (ARAIs) used on an individual have too large of a confidence interval to express relapse prediction in a meaningful way, and thus, must be interpreted with caution, if at all. According to Nilsson et al. (2009), forensic predictions are a poor predictor of future criminality, and thus, there is a high possibility that the results of these assessments can be misused or misunderstood. Therefore, it is important to understand the capabilities of the risk assessment tool being utilized.

1.2.1. Risk Assessment to Inform Treatment

Risk assessment instruments are important because of their ability to identify offenders based on their risk level. Following a third or fourth generation risk assessment and a review of the dynamic risk factors, an assessor is able to suggest an appropriate and targeted intervention in order to decrease recidivism (Daffern et al., 2009). Over the years, as the utility of risk assessment in forensic populations has been increasingly evident, it has become partially

regulated by law and described in the terms of directives and guidelines (Nilsson et al., 2009). Although many academics and clinicians support the use of risk assessment tools in forensic practice, there are many others who are sceptical of their use. Nilsson and colleagues (2009) argue that most risk assessment tools have weak predictive power and do not have enough detailed recommendations to allow for the appropriate categorization in forensic interventions.

Another issue that Nilsson et al. (2009) raise regarding risk assessments is the period of time that the risk assessment predictions are supposed to cover (2009). This is an important consideration when looking at risk assessment tools since they can be "perishable goods" (Nilsson et al., 2009). Little is known about how long the risk might exist and how the dynamic risk factors can change over time. This issue is not often addressed and the results of a risk assessment are often followed as blind truths; clients may not be reassessed as their circumstances change (Nilsson et al., 2009).

1.3. Psychology of Criminal Conduct

With the creation of third and fourth generations of risk assessment, emerged a reliance on the Psychology of Criminal Conduct (PCC; Andrews & Bonta, 2010) in scale development. The LSI-R and its variants have been developed based on the PCC, which uses social learning, cognitive-behavioural and social cognition approaches to explain how criminal behaviour occurs (Andrews & Bonta, 2010). The PCC is now a key component of forensic psychology and considered a major player in criminology and criminal justice (Andrews, Bonta & Wormith, 2006). The factors contributing to criminal behaviour can differ across time and situation; however, it is believed by some that the process is universal across different ethnicities, gender and age categories (Brews, 2009). It is important to address the PCC and recognize that when it comes to criminal recidivism, there are a number of sources in variation (Andrews et al., 1990). Andrews et al. (1990) have cited a number of these sources of variation, which can include: offender preservice characteristics, correctional worker characteristics, content and delivery method of services, and the intermediate personality characteristic and circumstances of the offenders. The social learning model and PCC perspective assumes that offending is multiply determined and intervention of some of these factors is possible (Hanson, 2009). Thus, treatment to target some of these factors leading to criminal behaviour would be appropriate targets.

Andrews and Bonta (2010) have identified the "big four" risk factors as being the strongest predictors of recidivism: antisocial attitudes, peers, personality and static criminal

history. Studies that have examined these risk factors in a female offender sample have demonstrated promising results. These big four factors have been shown to predict new offences in females (Salisbury, Van Voorhis & Spiropoulos, 2008). In addition, Andrews and Bonta have also found that high risk offenders are often more responsive to treatments and require more services, ultimately leading to a reduction of recidivism (2010). As a result of such findings, risk assessment has become an important procedure to guide clinical practice and directions in offender programming. Making distinctions between high and low risk offenders, supports treatment planning as it allows the appropriate services to be targeted to the offenders in greatest need. This can be best explained through the Risk, Needs, and Responsivity Model (RNR; Andrews, Bonta & Hoge, 1990)

1.4. Risk, Needs, and Responsivity

Andrews and colleagues (1990) believe that more research is required to examine the idea that some programs would be working with certain offenders under certain principles, but others are not. They argue that these principles are risk, need, and responsivity. It is believed by some that the movement away from incarceration might be a more effective form of treatment as the community appears to be the preferred context for rehabilitation. Andrews et al. (1990) have highlighted two factors that are key to promoting program implementation: awareness of the literature on effective practices, and willingness to accept a shift in policy.

With respect to RNR model, risk refers to the principle that higher levels of service are best suited for high risk cases (such as clients scoring high or very high on the LSI); similarly, clients deemed as low risk would receive minimal service. This is based on previous research which has demonstrated that the treatment effects are often greater on high risk cases. In fact, more intensive treatments in low risk cases have actually been shown to increase recidivism rates (Lowenkamp & Latessa, 2004; Latessa and Lovins, 2010). Latessa and Lovins (2010) explain that there are three reasons that this occurs. First, when placing low risk offenders in intense program, they are often with high risk offenders, therefore, they may learn some criminal behaviour from the high risk offenders. Second, in a highly structured environment, the factors that make these offenders low risk are disrupted. For example, an intensive program might cause someone to lose their job, distract from family life and cut off prosocial ties. Finally, there might be other factors such as IQ, intellectual functioning and maturity. Lowenkamp and colleagues

(2006) suggest that some low functioning and low risk offenders might become easily manipulated by the more intelligent, higher risk offenders.

Criminiogenic needs are the second component of the RNR model and refer to dynamic risk factors (such as antisocial attitudes, feelings, peer associations, family connectedness and self-control). When these needs are altered, they are associated with variations in the changes of criminal conduct. The third and final component of the RNR model is responsivity.

Responsivity refers to the styles and modes of service that are capable of influencing the specific targets of offenders; they should be appropriately matched to the learning styles of offenders (Andrews et al., 1990). Typically, the appropriate types of service involve the use of behaviour and social learning principles, skills enhancement and cognitive change (such as modeling, graduated practice, rehearsal, role playing and reinforcement). It is also suggested through the RNR model that certain aspects should be avoided. This includes: group programming (if it reinforces criminogenic attitudes); official punishment, because people are not actually "scared straight"; and psychodynamic therapies, since they are not usually effective in the offender population.

The idea of RNR has become very popular in corrections research, assisting in minimizing the "nothing works" mentality. The presence of RNR has been shown to correlate highly with treatment outcome regardless of client age, race or gender. However, regardless of these positive findings, there are still some critics who are able to highlight some negative results from the areas of cognitive skills training and multi-systemic training (MST). Andrews et al. (1990) argued that we must look beyond these results and instead of looking at the simple outcome measures, look at the specifics of the program and the participants: the main premise of the RNR principles. It is recommended that evaluations should focus more on program integrity, treatment resistance, motivation, motivational interviewing, attrition, and facilitator characteristics (Andrews et al., 1990).

1.4.1. RNR and Risk Assessment Tools

The LSI, and its derivatives, is among the most popular and well known examples of dynamic assessments. These RNR factors are important determinants of where treatment dollars should be allotted, with predictors of recidivism given a greater priority over predictors that are not associated with recidivism (Salisbury et al., 2008). These distinctions between risk and need prompted the formation of two principles that have had a profound impact on correctional

practice and funding priorities, the risk principle and the need principle (Salisbury et al., 2008). The risk principle was developed following consistent results showing that the most effective programs for reducing recidivism were programs directed at medium to high risk clients. The need principle, on the other hand, posits that the greatest reductions in risk occur by targeting dynamic risk factors as defined by needs that have been found to be correlated with future offending (Salisbury et al., 2008). Salisbury et al. (2008) describe some of these dynamic risk factors as antisocial attitudes, criminal peers, education, employment, satisfaction with family life, and financial wellbeing (2008).

Tools that have been designed to assess needs rather than risks were developed to look for specific education, employment, substance abuse, mental health, family, financial or medical needs (Salisbury et al., 2008). Research has demonstrated that many of these needs are also significant risk factors that have been found to predict prison misconduct, technical violations and new offences (Andrews et al., 1990; Brews, 2009). In light of these findings, most of the more recent risk assessment instruments now incorporate both offence-based predictors (risk) and criminogenic needs. According to Salisbury et al. (2008), community correctional agencies have began to accept the dynamic risk assessment tools much faster than the prisons, particularly because they are more prepared and are better equipped to assess strengths and weakness and aid in offender case management. However, the use of dynamic risk assessment tools has been encouraged recently and a number of institutions are beginning to implement dynamic risk or need assessments in prisons (Salisbury et al., 2008).

Despite the promising findings that are emerging out of much of the corrections research based on the RNR principles, we still do not really know what works, specifically with respect to criminal sanctions. The effects of criminal sanctions on recidivism have been minimal and inconsistent. However, this could be a result of the quality of evaluations being conducted rather than the actual effectiveness of the program. For example, better controlled evaluations often report more positive effects (Andrews et al., 1990). According to Andrews and colleagues (1990), this again shows that certain programs are working for certain individuals under certain circumstances, highlighting the importance of studying this notion further.

1.5. Risk Assessment Scales

Some of the most commonly used risk assessment tools (general and specific) in North America are: the Violence Risk Appraisal Guide (VRAG; Harris, Rice, & Quinsey, 1993), the

Historical, Clinical, Risk Management Scale (HCR-20; Webster et al., 1997), the Statistical Information on Recidivism Scale (SIR; Nuffield, 1982), the Psychopathy Checklist – Revised (PCL-R; Hare, 1980), the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS; Brennan & Oliver, 2000), the Violence Risk Scale (VRS; Wong & Gordon, 1998 – 2003), and the Level of Service Inventory–Revised [(LSI-R; Andrews & Bonta, 1995; Andrews, Bonta, & Wormith, 2004); (Ancher et al., 2004; Andrews et al., 2006; Blanchette & Brown, 2006; Pozzolo et al., 2006].

1.5.1. The Statistical Information on Recidivism (SIR)

During the shift from unstructured clinical judgement to more structured actuarial tools, the CSC adopted the General Statistical Information on Recidivism Scale (GSIR; Nuffield, 1982). The GSIR scale was one of the first risk assessment tools used by CSC. Developed in 1982, it is an example of one of the earlier second generation risk assessment tools. It was originally used to assess the level of risk for male offenders within the correctional system (Hanson, 2009). The GSIR is a measure of general criminal behaviour and is composed of 15 actuarial items (such as material status and employment; Pozzulo et al., 2006). The score on these items were then combined for a total score and weighed result based on an empirically derived weighting system (Hanson, 2009).

A lower score on the GSIR indicates a higher risk of recidivism (Kroner & Loza, 2001). This measure is widely used by both the Correctional Service of Canada and the National Parole Board (Pozzulo et al., 2006). This scale has demonstrated predictive validity for both general and violent recidivism (Bonta, Harman, Hann, & Cormier, 1996; Hoffman, 1994; Mills, Kroner, & Hemmati, 2004). Bonta et al. (1996) found an overall correlation of r=.42 with recidivism using the GSIR for males. However, in females, the correlation is lower at r=.25 and results presented an irregular pattern (Bonta et al., 1996).

As an update to the GSIR, Nafekh and Motiuk (2002) developed the Statistical Information on Recidivism-Revised Scale (SIR-RS). This scale is composed of 15 static items designed to predict offender recidivism. Like the GSIR, the SIR-RS is composed of demographic and criminal history items. This scale is believed to be reliable and valid up to three years following release; reporting the likelihood of reoffence in terms of five equally proportioned risk categories (Blanchette & Brown, 2006).

1.5.2. The Violence Risk Appraisal Guide (VRAG)

There are a number of different measures used in Canada and throughout the world to predict risk. The Violence Risk Appraisal Guide (VRAG; Harris et al., 1993) is one of the most popular actuarial assessment tools (Pozzulo et al., 2006). This risk assessment tool has been validated in at least five different countries (Pozzulo et at., 2006). It was originally developed to assess violent recidivism in a sample of male offenders who were mentally disordered and residing at a maximum security hospital. The VRAG has either been equally successful or more successful than all other methods of prediction with which it has been compared (Harris et al., 2002; Banks et al., 2004). Individuals with higher VRAG scores have the greatest risk of violence reoffence (Bloom et al., 2005). Items on the VRAG include the total score on the PCL-R as well as items that are related to criminogenic and noncrimiogenic factors. Harris et al. (2002) conducted a study comparing the VRAG to composite clinical judgements. While both methods could identity a large number of the truly dangerous individuals, the VRAG had significantly fewer false alarms.

The VRAG is one of the more popular risk assessment instruments. It was developed in Canada in order to estimate the probability of reoffence in mentally ill offenders (Kroner et al., 2007). What separates the VRAG from other instruments is that it was developed based on empirically determined risk factors, only containing static risk variables. This tool was initially developed using a sample of 618 male offenders housed in a high security hospital (Harris et al., 1993). However, it has since been validated in a number of different populations and is believed to have high predictive accuracy for both violent and non-violent criminal recidivism (Kroner et al., 2007).

Kroner et al. (2007) found that the VRAG had a high predictive accuracy in a German sample, which was previously untested. This was illustrated by a ROC analysis with an AUC of 0.703. They also reported the predicted probability of the VRAG, which was correlated with observed rates of recidivism significantly at a Pearson's $r = 0.941$. These results indicate that the VRAG was reliable and valid in a German sample, yielding good predictive accuracy despite the differences found between the German sample and the original Canadian sample. In addition, this scale examines a number of factors: living conditions, elementary school maladjustment, history of alcohol problems, marital status, non-violent criminal history, failure on prior conditional release, age at index offence, victim injury, any female victim, meets DSM-III

criteria for any personality disorder, meets DSM-III criteria for schizophrenia, and psychopathy checklist score (Kroner et al., 2007).

1.5.3. The Psychopathy Checklist–Revised (PCL-R)

The Psychopathy Checklist – Revised (PCL-R; Hare, 1980) is a 20 item assessment instrument designed to measure personality and behavioural features of the construct of psychopathy. Although it was initially designed as diagnostic/personality measure to obtain a valid and reliable diagnosis, psychopathy has been shown to correlate highly with general and violent criminal recidivism. As a result the PCL-R is often considered a risk assessment instrument (Dahle, 2006; Olver et al., 2009). In addition, the PCL-R has been included in some other risk assessment instruments, such as the VRAG. This scale was divided this scale into two factors: emotional detachment and antisocial lifestyle. Emotional detachment includes the items which reflect: glibness, grandiosity, pathological lying, conning/manipulative, lack of remorse/guilt, shallow affect, callous/lack of empathy, and failure to accept responsibility. Antisocial Lifestyle includes the items: need for stimulation, parasitic lifestyle, poor behavioural controls, early behaviour problems, lack of long-term goals, impulsivity, irresponsibility, juvenile delinquency, and revocation of conditional release. There are two additional items that do not load on either factor; many short-term relationships and criminal versatility.

Although the PCL-R was not developed to be a risk assessment instrument, psychopathy has been shown to predict persistent delinquency and future violence (Hare, 1999). The PCL-R is believed to be a psychometrically sound assessment of psychopathy, a construct that is empirically related to crime and violence (Hanson, 2009). There are several variants of the PCL-R, including the PCL-Screening Version (PCL-SV; Hart, Cox, & Hare, 1995). Several of the risk assessment tools used in the criminal justice system include the PCL-R, or components of the PCL-R (Warren et al., 2003). Specifically, the PCL-R correlates with recidivism, $r = .33$, in male offenders (Hare, 1996). However, results have been mixed and inconsistent when used in female offender samples (Folson & Atkinson, 2007). Interestingly, when compared with the GSIR, the PCL-R was not able to predict violent recidivism any better, yet the PCL-R is widely accepted among mental health professionals, where the GSIR has gone relatively unnoticed (Hanson, 2009).

1.5.4. The Historical/Clinical/Risk Management Scale (HCR-20)

The Historical, Clinical, Risk Management Scale (HCR-20; Webster et al., 1997) was designed for correctional and forensic patients in order to assess for physical, threatening, and criminal violence (Warren et al., 2005). It is one of the risk assessment scales that fall within the third generation and is composed of both static and dynamic risk factors (Olver et al., 2009). Specifically, it was designed after a review and analysis of the literature, for those who wanted to predict violent risk (Kroner et al., 2007). This tool is an example of structured professional judgement (SPJ; Olver et al., 2009), by accommodating clinicians in conducting their decision making by acting as a sort of memory aid (Ho, Thomson & Darjee, 2009). The assessor arrives at an appraisal of risk (in the form of a summary rating of low, moderate, or high) based on the groupings of item ratings (Olver et al., 2009). It is believed that through this process, the assessors are able to develop a risk assessment plan that is unique and targeted towards an individual offender. The HCR-20 has become one of the most popular methods of structural risk assessment, especially in Canada, Australia, and Scandinavian countries (Warren et al., 2003).

The HCR-20 is made up of three scales. The first, Historical (H) scale has ten variables that are largely static in nature, examining previous history. Second, the Clinical (C) scale has five items designed to address the individual's current mental, emotional and psychiatric status. Finally, the Risk Management (R) Scale is also made up of five items, designed to appraise potentially destabilizing future living conditions (Dahle, 2006). When conducting an assessment using the HCR-20, the H items are determined based on examinations from the beginning of an offender's sentence. The C and R items, on the other hand, rely on behavioural descriptions derived from their personal prison files (Dahle, 2006). Items are not typically scored; instead, professionals use the tool to develop their own judgements on risk level. However, some studies have summed the scores in order to conduct psychometric analyses, although, this is not typically the method employed (Olver et al., 2009).

There have been mixed results on the utility of the HCR-20. Like the VRAG, it was initially developed for use in forensic psychiatric samples; however, it has since been validated in a number of prison populations as well (Dahle, 2006). The HCR-20 is currently used to determine risk for physical, threatening and criminal violence in a number of forensic and civil settings (Warren et al., 2003). However, Warren et al. (2003) reported that when the PCL-R and

the HCR-20 were entered into a multiple regression for criminal prediction (violent and non-violent), the HCR-20 did not add to the variance explained by the PCL-R.

1.5.5. The Correctional Offender Management Profiling for Alternative Sanctions (COMPAS)

The Correctional Offender Management Profiling for Alternative Sanctions (COMPAS; Brennan & Oliver, 2000) is one of the best known fourth-generation risk assessment instruments (Andrews et al., 2006). The COMPAS was developed in an attempt to provide information to assessors on risk and needs of adult correctional offenders in order to assist in decision making for the placement of offenders in community (Fass et al., 2008). What separates the COMPAS from other risk assessment measures is that instead of providing a single risk score, there are also separate scores for violence, recidivism, failure to appear, and community failure. Also, a criminogenic and needs profile is created for each offender assessed by the COMPAS, which provides detailed information about the offender and their criminal history, needs assessment, criminal attitudes, social environment, socialization failure, criminal opportunity, criminal personality, and social support (Brennan & Oliver, 2000).

It appears as though only two studies have been published assessing the validity of COMPAS as a risk assessment tool (Fass et al., 2008). The initial validation study conducted by the scale developers found the COMPAS to have very good predictive validity, as illustrated with an AUC of .79. However, the small data set and use of the same sample to develop and validate the scale has made the generalizability of these results difficult (Fass et al., 2008). Fass et al. (2008) conducted the second study looking at the validity of the COMPAS. These authors concluded that the validity of the COMPAS differs between the racial groups being studied. They believe that these results suggested that different groups could be differentially affected by certain risk and need factors that lead to recidivism. These results must be interpreted cautiously, however, since they had a relatively short follow-up time.

1.5.6. The Violence Risk Scale

The Violence Risk Scale (VRS; Wong & Gordon, 1998-2003) was developed using the PCC to assist treatment providers who work with high risk/need nonsexual violent offenders in order to integrate risk assessment and treatment (Wong & Gordon, 2006). Assessor ratings on six static and 20 dynamic variables are used to make predictions on a client's level of risk. The results of a VRS assessment are said to have the ability to inform treatment in terms of who to

treat, what to treat and how to treat (Wong & Gordon, 2006). As a fourth generation risk assessment tool, the VRS also has the ability to assess positive treatment changes and risk reduction quantitatively and link those changes to recidivism. Wong and Gordon (2006) examined the VRS scored of 918 male offenders and found acceptable interrater reliability and internal consistency. In addition, the VRS was shown to predict both violent and nonviolent recidivism over both short and long term follow-up (up to 4.4 years).

1.5.7. The Level of Service Inventory

The Level of Service Inventory (LSI; Andrews, 1982) is one example of a classification system developed to assist with risk assessment and offender stream placement. The LSI is a theoretically and empirically based risk/need assessment instrument developed by Canadian researchers (Andrews et. al, 1990; Simon, 2008). Although it was developed on a primarily male sample, a number of revisions and derivatives have emerged, improving and expanding on the original version. The LSI-Revised (LSI-R; Andrews & Bonta, 1995) is an example of a third generation assessment tool. The LSI-R was designed to measure offender characteristics and situations in order to appropriately inform decisions regarding the level of service necessary for each offender through a focus on criminogenic needs. It was developed for male offenders in order to predict general recidivism, and more recently, it has been shown to predict recidivism in female offenders as well (Heckert & Gondolf, 2004).

The LSI-R was designed specifically for use in the general offender population, unlike many other assessment which have been designed for specific types of offenders, and specific reoffences, such as violent or sexual (Manchak, Skeem, & Douglas, 2007). This measurement tool was developed using social learning in order to discriminate among offenders' criminal risk and needs (Coulson et al., 1996; Heckert & Gondolf, 2004). The original development sample included both probationers and offenders who have been sentenced for less than two years (Manchak et al., 2007).

The LSI-R contains 54 items which measure the "Big Eight" as well as other criminogenic factors (for a review, see Andrews & Bonta, 2010). The items are scored as either 0 (absent) or 1 (present). Assessors assign these scores based on interviews and file reviews. The items are grouped into 10 subscales: Criminal History, Education/Employment, Finances, Family/ Marital, Accommodations, Leisure/Recreation, Companions, Alcohol/Drug, Emotional/

Personal, and Attitude Orientation. The LSI-R is made up of static and dynamic risk factors, making it a third generation tool. A composite score is derived from these items that indicates an offenders overall level of risk and criminogenic need (Holsinger et al., 2006). Assessors are also able to look at the individual subscales in order to address specific risk-need factors. But by assessing an interview using the LSI-R, assessors are able to apply a valid classification (e.g., high, medium, or low-risk), and identify the most criminogenic needs in order to facilitate case planning and treatment intervention (Andrews & Bonta, 2001).

What sets the LSI-R apart from other tools is its ability to inform correctional classification and management decisions (Manchak et al., 2007). An LSI-R can assist the correctional professionals in their decisions regarding levels of supervision, program or institutional classification, release from institutional custody, bail, and security ratings, in addition to providing the overall estimated risk to reoffend (Kroner & Mills, 2001; Lowenkamp & Latessa, 2002). Several studies have found the LSI-R to be both reliable and valid as a risk assessment tool (Holsinger et al., 2006). There is also evidence of the LSI-R's predictive validity in a number of different subgroups, including: female, Aboriginal and Black offenders (Holsinger et al., 2006).

The LSI-R has been used in a number of different situations for classification as well as management. This includes use in probationers, male inmates, female offenders, Native American inmates, juvenile offenders and sexual offenders (Schlager & Simourd, 2007). It has acceptable internal consistency (r=.72), interrater reliability (r=.94), and temporal stability (r=.80; Bonta & Motiuk, 1990, 1992; Schlager & Simourd, 2007). In a meta-analysis of 30 studies, the LSI-R was found to correlate moderately at r=.38 with general recidivism (Gendreau et al., 2002; Manchak et al., 2007). The LSI-R predicts general recidivism better than violent recidivism, however, the updated Level of Service/Case Management Inventory (LS/CMI; Andrews et al. 2004) improves this predictive validity by incorporating more items designed to assess the risk of violent recidivism. These additional items are said to predict violent recidivism as well as the best violence risk assessment measures developed to date (Manchak et al., 2007). Thus, if it is violent recidivism, rather than general recidivism that one would like to predict, it is suggested that the LS/CMI is used over the LSI-R.

1.5.7. The Level of Service Inventory-Ontario Revision (LSI-OR) and Level of Service/Case Management Inventory (LS/CMI)

The LSI-Ontario Revision (LSI-OR; Andrews et al., 1995) is currently being used throughout Ontario's probation services and provincial institutions (Brews, 2009). This is an example of a fourth generation risk assessment tool. It was developed in hopes of creating a more accurate tool to assess the risk of reoffence in male and female offenders in the Province of Ontario. In order to develop the best possible risk assessment tool for the Ontario offender population, the researchers consulted a number of representatives from community institutional corrections in Ontario (the Probation Officers Association of Ontario, the Ontario Board of Parole, the Commission on Systemic Racism, the Office of Youth Justice, and the Organizational Renewal Project) to inform the development of this tool. In addition to this consultation processes, the researchers conducted a thorough review of the assessment literature and a reanalysis of predictive data (Andrews et al., 1995). Thus, the LSI-OR is a theoretically based risk assessment tool composed of items that were developed based on a general personality and social psychology approach in combination with the Personal, Interpersonal and Community-Reinforcement Theory (Brews, 2009; Vose et al., 2009).

The LSI-OR is the updated version of the already well accepted LSI-R, with three additional sections intended to guide case management that prior versions of the LSI-R did not include: Institutional Factors (10 items), Other Client Issues (18 items), and Special Responsivity Considerations (8 items) (Girard & Wormith, 2004; Simon, 2008). From these items, scores are derived and then used to determine an offender's risk level. Offenders receiving a score of 0 to 4 are classified as very low risk, low risk being 5 to 10, medium risk from 11 to 19, high risk from 20 to 29 and very high risk is any offenders with a score greater than 30. An offender receiving a higher score on the LSI-OR indicates a greater likelihood of engaging in criminal (or inappropriate) behaviour. This can include institutional offences, reoffence, and breach of community supervision.

After the score is determined from the LSI-OR instrument, the assessors are allowed the opportunity to override the risk level, either increasing or decreasing the client's risk level. If an adjustment is made, the assessor must make a logical argument for why this override was made, considering all of the sections of the LSI-OR. As such, initial and override risk levels should be examined to determine how the LSI-OR is influenced by clinical adjustment.

Some modifications to the LSI-OR have since been made for use in other populations outside of Ontario, this tool is called the Level of Service/Case Management Inventory (LS/CMI; Andrews et al. 2004). The LS/CMI is said to be valid and reliable in assessing female offenders as it was developed using normative data which included over 20,000 female institutional and community offenders from four countries (Andrews et al., 2004).

The LSI and its derivatives have been shown to be a valid instrument for the prediction of recidivism, institutional behaviour, halfway house failure, probation failure, and incarceration (Coulson et al., 1996). As mentioned previously, the majority of risk assessment tools are criticized for being designed for a male population and not translating well to a female population (Hannah-Moffet & Shaw, 2001). This criticism also exists for the LSI-OR and it is argued that more research must be conducted in order to determine if this tool is capable of predicting reoffence for both male and female offenders (Brews, 2009). One such study was conducted by Brews (2009).

Looking at the applicability of the LSI-OR on female offenders, Brews concluded that the LSI-OR had strong internal consistency, with the ability to distinguish female offenders committing a reoffence from those who did not commit a reoffence (2009). These findings were consistent when looking at the scale as a whole as well as when considering the subscales. In addition to predicting recidivism for female offenders, it also predicted recidivism for all of the subgroups of offenders other than those on a conditional sentence and experiencing previous victimization. Brews (2009) concluded that the use of the LSI-OR with females was supported by his research, but he suggested that in order to reduce the potential for over-classification and increase predictive ability, new risk levels should be considered. However, this study lacked a male comparison group, which makes it difficult to make important inferences to the LSI-OR's utility for women. For this reason, this study will look into creating a replication of Brew's work while allowing for a male-female comparison group as well as a comparison between ethnicities.

Olver, Stockdale and Wormith (2009) performed a meta-analysis of three risk assessment instruments (youth adaptations of the LSI and the PCL, and the Structures Assessment of Violence Risk for Youth) and found that all risk assessment measures were able to significantly predict general, nonviolent and violent recidivism. Although the instruments were all found be reliable and valid, no one instrument demonstrated superior prediction. None of the 95% CIs were below 95% and they all had comparable degrees of predictive accuracy in terms of their

overlapping CIs. These authors concluded that their results supported the predictive accuracy of youth adaptation of the LSI among male, female, Aboriginal and non-Aboriginal youth.

Similarly, Wormith, Olver, Stevenson and Girard (2007) examined the predictive validity of the LS/CMI, PCL-R and the DSM-II antisocial personality disorder (APD) on 61 offenders with a 10-year follow-up. All three measures were significantly able to predict future violence, reincarceration, and the severity of recidivism offence. However, no measure was able to predict above and beyond either of the other two measures, indicating that although they were all reliable and valid in the prediction of recidivism, no one tool was superior.

1.6. Special Consideration of Risk Assessments Tools

1.6.1. Gender and Risk Assessment

Female offender populations have often been understood as a unique population that has a different pathway to crime than males (Salisbury et al., 2008). Salisbury et al. (2008) identified these pathways unique to women as: extensive traumatic and abusive histories, experiences of acute mental illness (typically major mood disorders), issues with self-esteem and self-efficacy, dysfunctional relationships (especially with intimate others), overwhelming parental responsibilities and substance abuse (most often in the form of self-medication in order to mask emotional or physical pains). In this view, there are several additional criticisms in the literature related to using risk assessment on female populations. Mainly, it is argued that risk assessments are not appropriate for use on females because they have been created primarily from male based samples. Nilsson et al. (2009) argue that since these tools are developed using male-based samples, many of the unique assessment and treatment needs of women are not appropriately addressed. In addition, many clinicians and academics are now advocating a "gender-responsive" approach to supervision and treatment. Such an approach would entail a specific focus on the special needs of female offenders, which is said to include: abuse, mental health, substance abuse, relationship difficulties, self-esteem, self-efficacy, and parenting issues (Nilsson et al., 2009). It is argued that the unique situation of female offenders has not been given enough consideration and therefore, one cannot yet truly understand the relationship between women, these factors, and reoffence.

Risk assessment tools can be either gender-neutral or gender specific. Gender-neutral risk factors are those that are able to predict criminal conduct in females and males. These gender-

neutral factors can more strongly predict in females (female-salience) or males (male-salience). Gender-specific factors, on the other hand, can be either female-specific (predictive for females) or male-specific (predictive for females; Andrews et al., 2011). The gender-neutral perspective is built by the general personality and cognitive social learning (GPCSL) approach to criminality (Andrews & Bonta, 2006; Rettinger & Andrews, 2010). This is the same theory that guided the development of the RNR model. Following the GPCSL approach, the variables of age, race, gender, and social class are believed to contribute to criminality. However, this influence is believed to be indirect and operating through their impact on major personal, interpersonal, and setting variables (Rettinger & Andrews, 2010). Therefore, it is believed that these variables have a relatively small effect after considering the major GPCSL variables (the "central eight") (Rettinger & Andrews, 2010).

It is important to have risk assessment tools that are capable of predicting reoffence in all samples of offenders on whom they are used. The applicability of risk assessment tools and classification of female offenders has been disputed throughout the corrections literature. Since males comprise the majority of convicted offenders, it is argued that women are often ignored by both correctional researchers and practitioners (Brews, 2009; Salisbury et al., 2008). The most common concern with regards to classifying women is that scepticism exists towards using the same tools that were created for male offenders on female offenders (Brews, 2009; Emeka & Sorensen, 2009). Although researchers acknowledge that there is likely overlap in factors that determine offending behaviour in males and females, it is also important to understand that there are likely to be fundamental differences between them, and thus, tools originally created for male offenders may not appropriately assess the female population (Brews, 2009).

Although the percentage of incarcerated females is currently much lower than the percentage of incarcerated males, the proportion of women is increasing at a faster rate, with a ten year increase from 1995 to 2005 of 53%, compared to a 32% increase for incarcerated males in the United States (Salisbury et al., 2008). Not only are rates of female reoffending increasing at higher rates than males, they are also starting to offend at earlier ages (Emeka & Sorensen, 2009).

Due to the increasing prevalence of females in the correctional system, it is important that the risk assessment tools used on women are appropriately validated, since most of these tools have been developed on males (Bloom et al., 2003). Inadequate risk assessment tools leading to

inaccurate classifications can result in females receiving more restrictive supervision than necessary, or a failure to identify those who are most in need (Emeka & Sorensen, 2009). This concern is shared by researchers from both a community and an institutional perspective. It has been argued that when both the needs and criminal history factors are combined into a single risk assessment instrument, the emerging literature on gender responsivity is ignored (Bloom et al., 2003). Salisbury et al. (2008) argued that by constructing these risk assessment tools on males, a number of gender responsive factors are not being properly considered. They argue that, in particular, the factors of abuse or trauma, parenting, mental health, relationships and self-esteem, need to be examined in terms of the relationship to reoffence in the female sample. Women are often not factored into the development of any risk assessment instruments that are currently being employed (Salisbury et al., 2008). According to Salisbury et al. (2008), risk assessment tools that are used in the prison classification systems are especially problematic, due to over-reliance on assessment tools using static, current offence and criminal history predictors (Salisbury et al., 2008).

A few studies have proven custodial risk assessments valid for women; however, in these studies females classified at higher levels had less serious misconducts than males at the same custody level. In fact, females placed in maximum security often had a similar number of misconducts reported to that of males in medium security (Brennan, 1998; Fowler, 1993; Hardyman & Van Voorhis, 2004; Salisbury et al., 2008). This over-classification problem is not unique to static risk assessment instruments. A study by the Washington State Institute for Public Policy found that recidivism for high-risk males was 10% higher than high-risk females using the dynamic LSI-R (Washington State Institute for Public Policy, 2003).

Some researchers suggest overcoming these gender issues by creating cut-off points for risk levels in male and female offenders separately. This would ensure that men and women at each risk level have similar behavioural outcomes, thus reducing the number of women in the higher risk categories (Harer & Langan, 2001). However, although this strategy is said to be more effective and may better reflect gender differences, it is still criticized for not considering the emerging gender responsive literature. It should examine risk management, security and community, since these risk assessment tools were developed on predominately (or solely) male samples, this is said to ignore any opportunity for gender responsivity.

1.6.2. Risk Factors for Women

Because there is a great deal of controversy regarding the differences between male and female offenders and the use of risk assessment tools on female offenders, a review of the research pertaining to five areas that are believed to be particularly relevant in the assessment of female offenders is presented below.

1.6.2.1. Victimization and Abuse

As mentioned previously, among the most critical issues identified in the current research on female offenders, is their previous history of victimization and abuse. Women who are under correctional supervision are more likely than male offenders (or women in the general population) to report having been victims of physical and/or sexual abuse in their lifetime (Salisbury et al., 2008). Reports of physical abuse in female offenders' ranges from 32% to 47%, compared to rates of 6% to 13% in male offenders. Similarly, women reported experiencing sexual abuse between 23% and 29% of the time compared to male offenders' rates of 2% to 6%. These are likely conservative reports, as some studies have reported up to 75% of offending women having suffered physical abuse (Salisbury et al., 2008). There is also a relatively strong association between child maltreatment and delinquency in young girls, but the link between victimization and criminal behaviour in women is clouded and inconclusive. However, it is important to understand that a greater prevalence of a specific characteristic does not in itself constitute a stronger risk factor. For this reason, this association should be explored in greater detail and given extra consideration to determine the acceptability of using certain forms of risk assessment on certain samples.

1.6.2.2. Mental Health

A second issue that appears to separate the female offender population from the male population is their mental health needs. Female offenders have been found to suffer from depression, anxiety, and self-injurious behaviour at greater prevalence than males. In addition, females often suffer from co-occurring mental disorders such as depression and substance abuse at almost four times the prevalence of males (Salisbury et al., 2008). Also, phobic disorders are two times more prevalent in females and panic disorders are three and a half times more prevalent in females than males. What is also interesting in the mental health literature is that these are sometimes categorized as responsivity factors, and as dynamic risk factors other times. Blanchette and Brown (2006), two of the leading researchers on correctional programming for

females, found that personal distress, mental ability and mental health variables were not strongly associated with recidivism. Salisbury et al. (2008) have identified two major problems surrounding this research: the type of disorders women typically suffer from, such as major mood disorders, are often overlooked by traditional risk assessment tools, and second, most of the past research on prediction studies aggregate mental illness indicators which may confound relevant associations. However, like the research on victimization, the associations between mental health and recidivism are still relatively unknown.

1.6.2.3. Dysfunctional Relationships

Another issue that may contribute to differences in risk prediction between males and females is related to their intimate relationships. Although relationships are important to all people, they are said to be even more important to women as a woman's identity, self-worth and sense of empowerment have been linked to relationship quality (Salisbury et al., 2008). The high rates of abuse and mental health issues in the female offender population make it difficult for many women to understand what constitutes healthy, mutually beneficial relationships, thus limiting their ability to achieve these healthy relationships. Instead, female offenders are much more likely to find themselves in co-dependent relationships which facilitate criminal behaviour and are difficult to leave (Salisbury et al., 2008). Research by Blanchette and Brown (2006) has found that many females felt that criminal behaviour may threaten important relationships in their lives, and therefore, are less likely to engage in such behaviour. Women who are engaged in dysfunctional relationships, feel that they do not have positive relationships, would be more likely to engage in criminal behaviour. Benda (2005) found that intimate partners could influence female offenders in both positive and negative ways. Criminal partners influenced recidivism where satisfying intimate relationships was related to desistance. However, there are very few studies that examine relationship quality and criminal behaviour, and more research must be conducted to make any sound conclusions.

1.6.2.4. Self-Esteem and Self-Efficacy

Although self-esteem has been linked to recidivism for women, more recent research has contradicted these findings, stating that programs targeting self-esteem are not very effective. Some studies have found that programs designed to increase offenders' self-esteem actually increase rates of recidivism (Salisbury et al., 2008). However, most of these studies are based on primarily male samples. When research has been conducted on female samples, the results have

been slightly more promising, where self-worth has been tied to desistance in female offender samples (Salisbury et al., 2008). In addition, there is a negative relationship between abuse and self-esteem in women in general, yet relatively little conclusive research has been conducted using female offenders, so we cannot make any causal determinants between abuse, self-esteem and offending behaviour. In addition, although little research has been conducted to examine self-efficacy, it is believed that this could play a major role in women's criminal behaviour and thus, should be an important target for treatment programming.

1.6.2.5. Parental Stress

Since approximately 71% of women who are under correctional supervision have at least one child less than 18 years of age, parenting is an important issue to address when dealing with female offenders (Salisbury et al., 2008). Salisbury and colleagues (2008) argue that the combination of parental demands, economic marginalization and substance abuse can lead to stress about how women can provide for their children, which may ultimately lead to recidivism. In fact, there has been evidence of a direct relationship between parental stress and crime (Salisbury et al., 2008). Recent research has found that parental stress in incarcerated women was also related to mental illness (Salisbury et al., 2008).

1.6.3. The LSI and Women

The LSI, in combination with the principles of Effective Correctional Intervention (ECI), has a large body of supportive literature across a number of jurisdictions including Canada, the United States, Britain, Europe, Australia, and New Zealand (Simon, 2008). The province of Ontario began using the LSI and the principles of ECI to modify their prior classification and supervision practices, which resulted in the implementation of the Probation and Parole Service Delivery Model (PPSDM). The LSI and its derivatives have demonstrated reliability and predictive validity across many field settings and offender populations. However, very few studies have addressed the predictive validity on large samples of female offenders, which has lead to criticism on the LSI's applicability to women (Blanchette & Brown, 2006).

It is important to study the applicability of the LSI and its derivatives on female offenders because female samples have been shown to differ significantly from males on a number of characteristics (Brews, 2009). Andrews and Bonta (2010) described a strong assessment tool as one that takes a number of risk factors into consideration in order to best strengthen predictive ability. Also, it is now believed that risk assessments should suggest appropriate treatment

options while providing indicators of treatment success. Folsom and Atkinson (2007), conducted a study to assess the LSI-R's applicability to female offenders due to its continued use in female offender samples despite the issues that are often present when predicting recidivism in this sample. They assessed 100 female offenders serving sentences two years or greater in Canada. The LSI-R showed acceptable reliability and predictive validity in this sample by distinguishing recidivists from nonrecidivists. This supports the claim that the LSI-R is gender neutral; with a gender neutral theoretical framework (Holtfreter & Cupp, 2007).

LSI proponents argue that in addition to being gender neutral, the LSI is also reliable and valid across other offender demographics, such as race and social class (Holtfreter & Cupp, 2007). However, not all researchers and clinicians agree with this perspective. Some feminists argue that the LSI-R cannot be gender neutral because it was developed from theories of crime and delinquency that were largely based on males (Holtfreter & Cupp, 2007). Yet, since there has been demonstrated predictive validity for both males and females, many would still argue that the LSI-R is gender neutral (Holtfreter & Cupp, 2007). Blanchette (2002), for example, agrees with the use of actuarial instruments in female offender classification since females are classified as lower risk than their male counterparts.

Interviews with female offenders, and LS/CMI risk assessment data, lead Rettinger and Andrews (2010) to conclude that although women in their study reported high rates of stressed and distressing circumstances, many of those factors that are said to be particularly relevant to the offending behaviour of females, had no incremental validity above and beyond that of the central eight risk factors. As such, these results failed to support the idea that those central eight factors are inapplicable for women following a gendered pathway (Rettinger & Andrews, 2010). However, this does not mean that the unique concerns of women should be ignored. It is important to recognize the distinction between the criminogenic and non-criminogenic needs, however, this does not mean that treatment should solely focus on the criminogenic needs. In fact, considering gender as a specific responsivity factor that can influence what services should be targeting and how they should be delivered is a sensible idea (Rettinger & Andrews, 2010). Thus, although these factors may not be strong predictors of recidivism, when present they may interfere with interventions targeting the central eight risk/need factors (Rettinger & Andrews, 2010).

1.6.4. Ethnicity and Risk Assessment

Just as many risk assessment tools are criticized for being developed on male samples and thus ineffective for use on female samples, they are also criticized for being developed on primarily Caucasian samples. Thus, it is important to ensure that these tools are validated on offender samples of differing gender and ethnicity. This is crucial in the criminal justice system since most of these tools are being administered on multiple samples, yet their validity in these samples is often not very well known. Of particular interest with Canadian risk assessment tools is their acceptability and utility for use on Aboriginal samples. In Canada, Aboriginal people account for three percent of the population, yet, they comprise 20% of the people in custody (Brzozowski, Taylor-Butts & Johnson, 2006). Statistics Canada has reported many differences between Caucasians and Aboriginals. Aboriginal Canadians generally suffer from higher unemployment rates and lower incomes when compared to Caucasian Canadians. Also, they are more likely to live in crowded conditions, have higher residential mobility, come from single parent families, and have lower levels of education (Brzozowski et al., 2006).

Fass et al. (2008) conducted a study looking at the predictive ability of the LSI-R and the COMPAS when used for risk assessment in ethnic minority samples. They concluded that both the LSI-R and the COMPAS presented inconsistent validity in different ethnic/racial populations. In addition, they suggested that the different ethnic/racial groups tended to have varying risk and needs factors predicting recidivism. Holsinger et al. (2003) looked at the risk assessment results on the LSI-R from an Aboriginal and non-Aboriginal sample. They found significant differences between these two offender groups on the overall risk score and within several of the 10 risk domains. However, the authors acknowledged that there was a small follow-up period and detailed information on these offenders was not available for their analysis. Instead, they could only look at the LSI-R and basic demographic information.

In 2006, these authors followed-up this initial study with more depth and found that when they used survival analyses, the results were much more promising (Holsinger, Lowenkamp & Latessa, 2006). They found the LSI-R total risk score to have good predictive validity as supported by appropriate survival rates, even when race and sex were controlled for. Although these authors concluded that the use of the LSI-R was validated for use on large samples of offenders, they reported some mixed results towards certain subgroups. Predictive validity was better for Caucasian offenders overall, male offenders overall, and Caucasian males and

Caucasian females in particular (Holsinger et al., 2006). These results were similar to those of Bonta (1989) who validated the LSI-R for Aboriginal offenders in Canada, yet still found that the tool was more predictive in the non-Aboriginal sample. Thus, although these past validation studies have yielded positive findings, the differences in predictive validity shows a need for more research. In addition, Holsinger et al. (2006) caution about generalizing results from Aboriginal samples in the United States to Aboriginal samples in Canada. Thus, more research is required in both countries to examine the general predictors of recidivism as well as the predictive validity of risk assessments.

Only in recent years have structured risk assessments become accepted in Germany. However, their utility, validity and reliability have been untested in the German population. For this reason, Dahle (2006) set out to test the validity of three North American risk assessment measures: the LSI-R, the HCR-20, and the PCL-R. In this study, he found that a large percentage of criminals fell into the medium risk category, and predictive accuracy was dependent on demographic, criminological and psychopathological characteristics of the offenders (Dahle, 2006). Although the risk categories were relatively good predictors, a few adjustments were suggested for adaptation to the German sample. This suggests that the assessment instruments were robust enough to overcome the boundaries of ethnicity (Dahle, 2006).

1.6.4.1. The LSI and Ethnicity

Holsinger et al. (2006) argue that extra consideration is required when interviewing Aboriginal offenders. This is important since the one-on-one interview between the offender and the assessor are crucial to the assessment process for the LSI-R. In particular, the assessor must take extra care with respect to relational expectations, communication styles, cultural heritage and customs, including jargon and dialect. The original LSI was shown to accurately predict recidivism in an Aboriginal male sample as early as the 1980s. Bonta (1989) found that the average LSI scores and recidivism level was approximately the same for Native American and non-Native American male offenders. According to Coulson et al. (1996) this indicates that the LSI offers a bias-free prediction of criminal behaviour for different cultural groups.

Tanasichuk and Wormith (2009) conducted a study to analyze whether the LSI-OR could be used as a valid measure in a sample of Aboriginal offenders in the Province of Ontario. Despite criticisms against using the LSI-OR for assessing the risk of ethnic minorities, these results suggested that the LSI-OR was valid in both male and female Aboriginal offenders for

general and violent recidivism (Tanasichuk & Wormith, 2009). However, this study did not examine a comparison group of non-Aboriginal offenders and therefore, results should be interpreted cautiously. Regardless, these are promising results that add weight to the argument that the LSI-OR is acceptable for use in minority samples, or at least in the Aboriginal population. In their conclusion, Tanasichuk and Wormith (2009) suggest that their findings indicate that the LSI-OR should continue to be used in Ontario as an appropriate risk/need assessment tool for Aboriginal offenders, as it is empirically backed.

Whiteacre (2006) examined the predictive validity of the LSI-R in a Black, Caucasian and Hispanic sample in the United States. They found that the Black sample was more likely to have false negatives in terms of predicting disciplinary incidents. As well, there was a consistent pattern of classification errors among the Black sample, above and beyond that of Caucasians or Hispanics. Fass et al. (2008) added to these findings by replicating the LSI-R's ability to predict recidivism rates for the entire sample. Similarly, they found that the Black sample was more likely to have false negatives than Caucasians or Hispanics. In contrast, Hispanics and Caucasians were more likely to have false positives (predicting no recidivism when there was) than the Black sample. Yet, another risk assessment tool, the COMPAS, actually created more false positives in the Black sample, which was opposite of the LSI-R.

Schlager and Simourd (2007) looked to examine the predictive validity of the LSI-R in Black and Hispanic male offenders in an American sample. Again, these authors found that the LSI-R had "acceptable" psychometric properties, although the predictive validity was lower than other studies conducted on the LSI-R. Schlanger and Simourd (2007) found that Black offenders often have a significantly more extensive criminal history than that of the Hispanics. Although they found significant differences between the LSI-R variables, Schlanger and Simourd (2007) argued that they were small and unlikely to be clinically meaningful. Thus, these authors support the use of the LSI-R in Black and Hispanic samples, yet still suggest the need for more research.

Folsom and Atkinson (2007) conducted a study in Canada to specifically examine the LSI-R: Self Report (LSI-R:SR) in Black, Caucasian and Aboriginal offenders. They found a pattern for women, where average scores for Black women were low, Caucasian women were medium and Aboriginal women were high risk. These results, particularly the placement of Aboriginals in the high risk group, have been found in the male offender literature as well (Bonta, Dauvergne, & Rugge, 2003; Folsom & Atkinson, 2007; Hann & Harman, 1989).The

results from Folsom and Atkinson (2007) must be interpreted with caution as it was a self-report measure that was examined, rather than a clinician completed LSI.

1.6.5. Risk Assessment and Cut-off Scores for the LSI

Normative data was used by the LSI-R creators to determine the five risk levels of the LSI-R (Andrews & Bonta, 2010). However, the creators have suggested that these risk assessment levels be assessed and refined based on the specific needs of individual jurisdictions and populations (Manichak et al., 2007). It is believed that different risk levels might emerge for different samples and be more appropriate for conducting risk assessment on special groups.

To determine if different LSI-OR risk level cut-offs should be used for female offenders, Brews (2009) examined three cut-off point options. He examined the risk levels as defined by the LSI-OR user's manual (Andrews et al., 1995), using five equally proportioned categories (the Coulson method; Coulson et al., 1996), and through recursive partitioning (Brews, 2009). Brews reported that the original cut-off levels provided an adequate distinction between recidivists and non-recidivists. The Coulson and the recursive partitioning methods yielded similar results that were moderately superior to the original cut-off levels. Thus, Brews (2009) suggested that future research should be conducted to examine different cut-off levels, particularly for female offenders.

Lowenkamp and Latessa (2002) also suggested that in order to best utilize the LSI-R for its predictive ability, different cut-off scores should be examined for other populations. They attributed the variation in results and inconsistency in the findings of predictive validity to potential needs differences regarding cut-off scores. Lowenkamp and Latessa (2002) recommended that program sites develop specific cut-off scores based on their own populations, rather than using levels derived from the original study.

Coulson et al., (1996) looked at altering the risk levels by choosing the categories so that each risk level contained 20% of the scores. In a sample of incarcerated female adult offenders, they found that this adjustment in risk levels yielded a consistent increase in failure probabilities in each increased level of LSI. They argued that although they chose to divide their sample into five equally populated groups, the score should depend on the level of risk acceptance and utility necessary for a particular purpose. They concluded that on all types of discharge, offenders who were deemed high risk were more likely to reoffend following release than females who were labelled low risk. These authors recommended that the cut-off scores for female offenders be

revised since the average woman scores significantly lower than the average male offender. Regardless, the concepts of the LSI, in this study, were robust enough to overcome the boundaries of gender. Thus, this study supports the use of the LSI in the criminal justice system for decision making for female offenders (Coulson et al., 1996).

1.7. The Present Study

This study was designed to examine the relationship between the LSI-OR and recidivism with a specific focus on gender and ethnicity. In Ontario, the Ministry of Community Safety and Correctional Services (MCSCS) conducts an LSI-OR assessment for all provincial offenders who are placed on probation, given a conditional sentence, or sentenced to one month or more in custody. However, regardless of this widespread use, there is still considerable scepticism regarding the use of the LSI-OR on females and ethnic minorities, both in custody and in the community. Therefore, this study was designed to assess the LSI-OR's utility at predicting recidivism among male and female Aboriginal, Caucasian, and Black offenders released from custody or being supervised in the community.

Specifically, this study was designed to examine the predictive validity of the LSI-OR using a sample composed of male and female offenders. Following the PCC assumption (which suggests that criminal behaviour is related to common factors for all people), LSI-OR scores should predict recidivism for all subgroups of offenders. With this in mind, the LSI-OR should predict recidivism for all offenders regardless of disposition, gender or race. This study utilized a database of all of the male and female offenders who were released from Ontario provincial correctional facilities, sentenced to a conditional sentence, or who began a term of probation in the 2004 calendar year. They were then followed up for a minimum of four years.

1.8. Hypotheses

In order to examine the LSI-OR's utility at predicting the risk to recidivate in a large cohort of male, female, Aboriginal, Black and Caucasian community and institutional offenders, two main hypotheses were made. First, it was hypothesized that the LSI-OR scores would be positively correlated with recidivism for males and females, indicating that offenders scoring higher on the LSI-OR would be more likely to reoffend. In examining this hypothesis, exploratory analyses will also be conducted in order to assess the reliability and predictive validity of the LSI-OR.

Second, it was hypothesized that the LSI-OR risk levels, based on existing cut-off levels, would better predict recidivism than risk levels based on the Coulson method. In examining this hypothesis, a number of analyses will be conducted in order to examine different groupings of LSI-OR raw scores using the Coulson method for different combinations of gender and ethnicity.

2.0 METHODOLOGY

2.1. The Sample

The original sample was comprised of all male and female offenders who were released from Ontario provincial correctional facilities after serving a sentence of at least one month, sentenced to a conditional sentence, or began a term of probation during one calendar year (2004), with the Ministry of Community Safety and Correctional Services (MCSCS)[1]. Offenders who did not have an LSI-OR associated with their release from custody or community supervision in 2004 were removed from the sample. In cases of multiple admissions or releases in the same year, only the first release from custody or first admission to community supervision was used. Consequently, each offender was only represented once in the final dataset.

The final sample consisted of 26,450 offenders (81.7%M and 18.3%F) released into the community from three different types of disposition: custodial sentence (N=4950:18.7%, 21.5%M, 6.1%F), conditional sentence (N=3225: 12.2%, 11.6% M, 14.6% F), and probation (N=18275: 69.1%, 66.8%M, 79.3%F). Most offenders for whom marital status was known, 47.8% reported being single (N=12641: 49.0%M; 42.2%F), 5.0% divorced (N=1332: 4.6%M, 6.8%F), and 0.6% widowed (N=151: 0.4%M, 1.3%F). In a relationship, 11.3% were in a common-law relationship (N=2983: 11.1%M, 12.0%F), 14.0% were married (N=3709: 14.5%M, 12.1%F), and 8.4% separated (N=2209: 8.1%M, 9.6%F).

Although citizenship was not known for 11.5% of the sample (N=3041), there were 122 different citizenships represented. Most offenders with known citizenship were Canadian (N=21442: 81.1%, 81.6%M, 78.8%). The second and third largest citizenship groups were Jamaican (N=236: 0.9%, 0.9%M, 0.8%F) and British (N=238: 0.9%, 0.8%M, 1.2%F). All other citizen groups had a maximum of 0.4% (N<100).

2.2. Measures

2.2.1. LSI-OR

It is MCSCS policy that an LSI-OR assessment is required for all adult inmates who are sentenced to at least one month custody, and to all probationers, and parolees (Wormith, 1997). The Level of Service Inventory (LSI) is one example of a classification system developed to

[1] It is MCSCS policy that an LSI-OR assessment is administered to all adult inmates who are sentenced to at least one month custody, and to all probationers and parolees (Wormith, 1997).

assist with risk assessment and offender stream placement. The General Risk/Need Factors section contains 43 items that are each scored dichotomously (given a score of 0 = not present or 1 = present), and refer to the history and characteristics of an offender. The items are organized into eight subscales: criminal history (8 items), education/employment (9 items), family/marital (4 items), leisure/recreation (2 items), companions (4 items), procriminal attitude/orientation (4 items), substance abuse (8 items), and antisocial pattern (4 items). The Specific Risk/Need Factors section contains two subscales: personal problems with criminogenic potential (14 items) and history of perpetration (9 items), also scored dichotomously. These items are intended to identify additional risk factors, criminogenic needs and responsivity issues, as well as guide the assessors in deciding whether to override the original risk level. The LSI-OR added three additional sections intended to guide case management; institutional factors (10 items), other client issues (18 items), and special responsivity considerations (8 items) (Simon, 2008; Girard & Wormith, 2004).

2.2.2. Recidivism

Recidivism can be measured in a number of different ways, ranging from contact with the law or self-reported recidivism, to offence specific convictions. For the purpose of the current study, recidivism was defined as any criminal offence for which an offender was returned into the MCSCS system on a reconviction, either sentenced to incarceration or community supervision. There are some limitations to consider with this definition. Any offences committed in other provinces could not be included, and neither could any sentences other than incarceration or community supervision (including: fines, suspended sentence, and alternative measures) (Simon, 2008).

In this analysis, recidivism was defined as any conviction recorded during the follow-up period in the Offender Tracking and Information System (OTIS), which tracks all offences that occur in the Province of Ontario. Three measures of recidivism were constructed from file information. First, a dichotomous yes/no variable was created to identify those who did and did not recidivate during the follow-up period. This was extracted from the official criminal records in OTIS. The second recidivism variable was the time to recidivate, which was measured in the number of days they were in the community and eligible to recidivate. Thus, for the custodial sample, the time to recidivate would be represented by the number of days from their release date to the date of reoffence or re-entry. In the community sample, this would be the time

between the LSI-OR assessment date and the data extraction date. The follow-up period ran from their release from custodial sentence/admission to community supervision in 2004 to the January 9, 2009 extraction date.

Finally, the third recidivism variable included was be the Offence Severity Scale (OSS; Stasiuk, Winter & Nixon, 1996), which is coded based on 26 rank ordered categories developed by the Research Department of the MCSCS Ontario in 1982. For the ease of interpretation, the offences have been recoded so that higher scores on OSS represent higher offence severity. This measure of recidivism is compiled by the MCSCS for all provincial offences committed in the Province of Ontario. This scale was originally developed on an analysis of 60,000 sentences given to offenders in Ontario over a period of one year, where the average sentence length helped determine offence severity (Stasiuk et al., 1996). The highest ratings were given to offences holding the longest average sentences ranging from 1 (unknown) to 26 (homicide). The OSS scores can also be used to differentiate between violent and non-violent offences. When looking at recidivism statistics, this measurement is particularly critical because it is important to know how offenders are reoffending, and if the offence severity differs between the assigned risk levels.

2.3. Procedure

Offender information was obtained from the Ministry's Offender Tracking and Information System (OTIS) in January of 2009. Offenders admitted to probation or a conditional sentence or released from custodial sentence in 2004 were identified electronically in OTIS. A computer search on the LSI database was then conducted by a provincial employee to identify which of these offenders had been administered an LSI-OR after they entered the Provincial system, but before their release from supervision for the community offenders and before their release from custody for the custodial offenders. The data from the two data files were then merged by offender identification number and saved in a single file for data analyses. Any evidence of recidivism, as indicated by a reconviction, was then recorded for each offender and saved in the derived database. Recidivism data were collected on January 14, 2009, pertaining to

offenders' status up to January 9, 2009. This database was then forwarded to the researcher for data screening[2] and analysis.

2.4. Research Design

The data were compiled by provincial employees and submitted to the researcher in SPSS files. This study was designed to examine the internal consistency of the LSI-OR and its ability to predict recidivism, discriminating recidivists from non-recidivists across gender, ethnicity and sentence type. The LSI-OR was be analyzed as a whole and separately considering the individual subscales. In addition, this study utilized the large sample in an attempt to validate the LSI-OR in Aboriginal, Black and female samples. Before the specific analyses were conducted, the data was screened for data entry errors, inconsistencies and missing data.

2.5. Statistical Analysis

2.5.1. Validity and Reliability

This study was designed to examine the internal consistency of the LSI-OR and its ability to predict recidivism. The LSI-OR was analyzed as a whole and separately to consider the individual subscales. This was done by calculating the Cronbach's alpha. In addition, this study utilized a large sample size in an attempt to validate the LSI-OR in different ethnic, gender and sentence types. Correlations were conducted between risk level and recidivism (for both initial risk level, and final risk level after override). Finally, the eight subscales were examined for internal consistency and predictive validity in the same way.

2.5.2. Gender, Race and Disposition

T-tests were used to determine significant differences between the multiple combinations of disposition, gender and ethnicity (e.g., gender by disposition, ethnicity by disposition, and ethnicity by gender). They were also used to compare the LSI-OR score of recidivists to non-recidivists for the whole sample, for separate offender types, for separate racial groups and for separate genders; broken down by disposition.

ANOVAs were used to examine disposition type as the independent variable and severity of the index offence as the dependent variable; disposition type and racial group as independent

[2] Data screening included removing offenders with LSI-OR assessment dates occurring after recidivism, and the removal of any glaring errors in data entry, such as age variables greater than 100 years.

variables and LSI-OR total score as the dependent variable; and, disposition type and racial group as independent variables and recidivism (yes, no) as the dependent variable. A Kaplan-Meier survival analysis was conducted on all offenders, and then separated for male and female offenders. Receiver Operating Characteristic Analysis were used to examine how the LSI-OR predicts recidivism for whole sample, by disposition, racial group, and gender.

2.5.3. Risk Level Cut-offs

The final part of the study looked at recidivism by risk level cut-off types. This examination looked at two different methods of grouping the LSI items into levels. The first grouping used the original and override risk levels based on cut-offs provided in the LSI-OR scoring sheet. The second set of LSI-OR risk levels were determined by dividing the sample into five equally proportioned categories (the Coulson procedure; Coulson et al., 1996). Pearson correlations, ROC analysis and survival analyses were conducted to determine the predictive validity of the risk levels derived from both schemes.

3.0. RESULTS

3.1. Race

Racial data was unknown for 4564 offenders (17.0%, 15.8%M, 22.2%F). Of the eleven race groups represented in the data, Caucasian offenders were the most common (N=15646: 59.2%, 59.9%M, 55.8%F), Black offenders were the second most common (N=1918: 7.3%, 7.5%M, 6.1%F) and Aboriginal offenders were the third most common (N=1692: 6.4%, 5.9%M, 8.6%F). There was a significant association between the disposition of the offender and the race of the offender (χ 2 (8) =1090, p<.001). While making up approximately 6.4% of the sample, Aboriginal offenders comprised 12.18% of all custodial sentences, 4.88% of all probation sentences and 6.14% of all conditional sentences. Caucasian offenders were also more heavily represented in custodial sentences. Caucasian offenders made up approximately 59.15% of the total sample, 67.49% of offenders serving a conditional sentence were Caucasian, 57.50% of those on probation were Caucasian, and 55.69% serving a conditional sentence were Caucasian. Black offenders were primarily made up of custodial offenders, with 9.09% of the total custodial sample, 8.09% serving a custodial sentence, and 6.60% on probation were Black. The breakdown of disposition by racial group can be found in Table 1. There was also a significant association between the disposition of the offender and the gender of the offender, (χ 2 (2) =620.2, p<.001). For a breakdown by gender please refer to Appendix A.

Table 1. Number and percentage of offenders by disposition and racial group

	Custodial	Conditional	Probation	Total
Caucasian	**3341** 67.49%*	**1796** 55.69%*	**10509** 57.50%*	**15646** 59.15%*
(Row %)	21.35%	11.48%	67.17%	100%
Aboriginal	**603** 12.18%*	**198** 6.14%*	**891** 4.88%*	**1692** 6.40%*
(Row %)	35.64%	11.70%	52.66%	100%
Black	**450** 9.09%*	**261** 8.09%*	**1207** 6.60%*	**1918** 7.25%*
(Row %)	23.46%	13.61%	62.93%	100%
Other	**335** 6.77%*	**404** 12.53%*	**1958** 10.71%*	**2697** 10.20%*
(Row %)	12.42%	14.98%	72.60%	100%
Unknown	**221** 4.46%*	**566** 17.55%*	**3710** 20.30%*	**4497** 17.00%*
(Row %)	4.91%	12.59%	82.50%	100%
Total	**4950** 100%*	**3225** 100%*	**18275** 100%*	**26450** 100%*
(Row %)	18.71%	12.19%	69.09%	100%

*Column percentages

3.2. Client Age at Extraction

The age of these offenders at the date of data extraction ranged from 22 to 90 years with an average of 37.94 years (SD=11.70). There was a significant age difference between disposition groups, F (2, 26446) = 48.622, p<.001. Since Levene's test was significant, post hoc analyses using Dunnett's C were examined. The custodial sample was younger (M=37.91, SD=10.85) than the conditional sentence sample (M=39.81, SD=11.85; d = - 0.167, r = - 0.083). The probation sample (M=37.61, SD=11.86) was younger than the conditional sentence sample (d = - 0.186, r = - 0.092). There was no difference in age between the custody and probation group (d = 0.026, r = 0.013).

Similarly, there was also a significant difference in age between racial groups, F (4, 26444) = 59.621, p <.001. Again, the Levene's test was significant, so post hoc analyses using Dunnett's C were examined. Aboriginal offenders were significantly younger (M=35.71, SD=10.08) than Caucasian offenders (M=38.52, SD=11.80), Other offenders (M=37.30, SD=11.239) and Unknown offenders (M=38.37, SD=12.50). Black offenders (M=34.99, SD=10.11) were significantly younger than Caucasian offenders, Other offenders and Unknown offenders. Caucasian offenders were significantly older than Other offenders. Other offenders

were significantly younger than Unknown offenders. There was no significant difference between males (M=37.92, SD=11.84) and females (M=38.00, SD=11.07) on their age at data extraction, F (1, 26447) = .180, p = .671; d = - 0.007, r = - 0.003). The Cohen's d and effect size for age differences between races are presented in Table 2.

Table 2. Cohen's d and effect size for age differences between races

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	35.71(10.08)	Black	34.99(10.11)	0.071	0.036
Aboriginal	35.71(10.08)	Caucasian	38.52(11.80)	- 0.256	- 0.127
Aboriginal	35.71(10.08)	Other	37.30(11.239)	- 0.149	- 0.074
Aboriginal	35.71(10.08)	Unknown	38.37(12.50)	- 0.234	- 0.116
Black	34.99(10.11)	Caucasian	38.52(11.80)	- 0.321	-.0159
Black	34.99(10.11)	Other	37.30(11.239)	- 0.216	- 0.107
Black	34.99(10.11)	Unknown	38.37(12.50)	- 0.297	- 0.147
Caucasian	38.52(11.80)	Other	37.30(11.239)	0.106	0.053
Caucasian	38.52(11.80)	Unknown	38.37(12.50)	0.012	0.006
Other	37.30(11.239)	Unknown	38.37(12.50)	- 0.090	- 0.045

3.3. Index Offence Severity

Offenders were given an offence severity rating based on their index offence, called the Offence Severity Score (OSS). The OSS ranged from 1 (unknown) to 26 (homicide). In the event of multiple index offences, only the most serious offence was made available for analysis. The mean index offence severity score in this cohort was 16.63 (SD=4.01) after unknown offences were removed. A one way ANOVA was then conducted with the disposition type as the independent variable and severity of the index offence as the dependent variable. Type of offenders' disposition was significantly related to the offence severity, F (2, 26440) = 849.433, p <.001). Since the Levene's test was significant, a post hoc analysis was conducted using the Dunnett's C test. This analysis indicated that the offence severity of the index offence of custody offenders (M=17.91, SD=4.98) was significantly higher than probation (M=15.97, SD=3.51; d = 0.450, r = 0.220) and lower than conditional sentence (M=18.35, SD=3.98; d = - 0.098, r = - 0.049). Probation was also significantly lower than conditional sentence (d = - 0.634, r = - 0.302). A means plot is presented in Figure 1 and the distribution of offences by severity level and disposition can be found in Table 3 (please refer to Appendix B for the offence severity breakdown by gender).

Figure 1. Means plot for index offence severity by disposition.

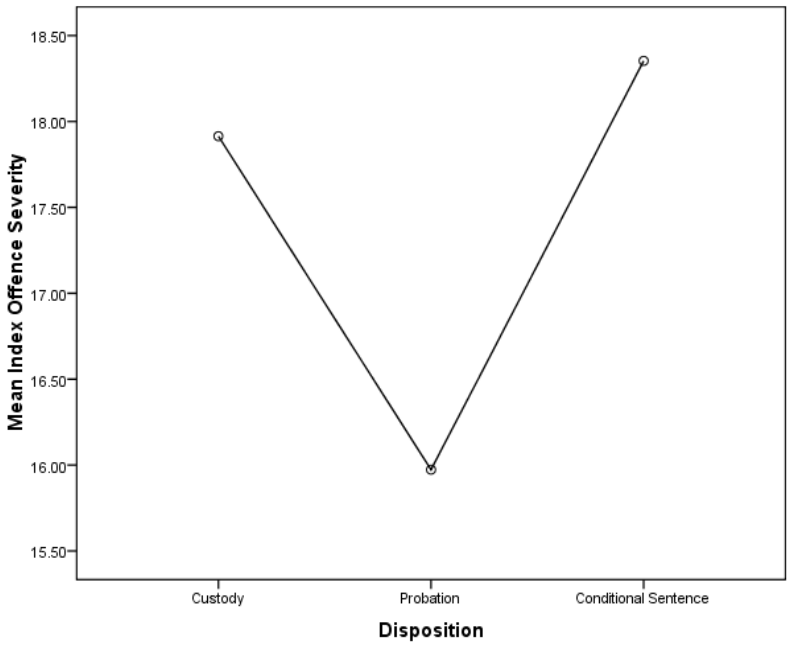


Table 3. Index offence severity frequencies and percentages, separated by disposition.

Offence Severity	Offence Type	Custodial		Conditional		Probation		Total	
		N	%*	N	%*	N	%*	N	%*
1	Unknown	4	.1	0	0	3	0	7	0
2	Municipal Bylaw Offences	0	0	0	0	2	0	2	0
3	Other Provincial Offences	41	.8	2	0.1	81	.4	124	.5
4	Liquor Licence Act Offences	1	.0	0	0	2	0	3	0
5	Highway Traffic Act Offences	76	1.5	0	0	127	.7	203	.8
6	Parole Violations	0	.0	0	0	0	0	0	0
7	Other Federal Statute Offences	26	.5	48	1.5	124	.7	198	.7
8	Misc. Offences against Public Order	3	.1	8	.2	333	1.8	344	1.3
9	Drinking & Driving Offences	174	3.5	66	2.0	605	3.3	845	3.2
10	Breach of Court Order / Escape	282	5.7	63	2.0	846	4.6	1191	4.5
11	Criminal Code Traffic Offences	195	3.9	84	2.6	154	.8	433	1.6
12	Drug Possession Offences	41	.8	94	2.9	594	3.3	729	2.8
13	Obstruction of Justice Offences	42	.8	20	.6	275	1.5	337	1.3
14	Morals & Gaming Offences	9	.2	11	.3	85	.5	105	.4
15	Arson/Property Damage Offences	39	.8	27	.8	976	5.3	1042	3.9
16	Assault & Related Offences	737	14.9	519	16.1	6586	36.0	7842	29.6
17	Theft/Possession Offences	708	14.3	369	11.4	2875	15.7	3952	14.9
18	Misc. Offences against the Person	327	6.6	119	3.7	1648	9.0	2094	7.9
19	Fraud & Related Offences	262	5.3	519	16.1	1203	6.6	1984	7.5
20	Weapons Offences	190	3.8	76	2.4	545	3.0	811	3.1
21	Traffic/Import Drug Offences	479	9.7	665	20.6	204	1.1	1348	5.1
22	Non-Violent Sexual Offences	82	1.7	97	3.0	140	.8	319	1.2
23	Break & Enter & Related Offences	705	14.2	173	5.4	635	3.5	1513	5.7
24	Violent Sexual Offences	160	3.2	144	4.5	136	.7	440	1.7
25	Serious violent Offences	341	6.9	93	2.9	95	.5	529	2.0
26	Homicide & Related Offences	26	.5	28	.9	1	0	55	.2
	Totals	**4950**	**100%**	**3225**	**100%**	**18275**	**100%**	**26450**	**100%**

*Column percentages

3.4. Internal Consistency of the LSI-OR

Cronbach's alpha was used to measure the internal consistency of the LSI-OR – the degree to which the LSI-OR measures a single construct. The eight subscales were also examined in the same way. Since three items from the LSI-OR are derived (in part, or completely) from other LSI-OR items, two sets of analyse were conducted. The first included all 43 items, and the second removed three items: early and diverse antisocial behaviour, criminal attitude and pattern of generalized trouble. Analysis revealed strong alpha levels for both the 43 item LSI-OR (r = .919) and the 40 item LSI-OR (r = .911). These alpha rates, as well as the alpha rates for all of the subscales for the total sample and divided by disposition, are displayed in Table 4. Subscales with four or fewer items had particularly low alphas (approximately .600 or lower), while the larger subscales all had alpha levels above .800. It is important to note that internal reliability can be affected by the number of items in a scale since it is based on the intercorrelation of scale items. Therefore, the lower alpha coefficients for the subscales with fewer items are expected. Please refer to Appendix C for a breakdown by gender and ethnicity.

Table 4. Alpha scores for total LSI-OR and subcomponents by disposition group

Scale (number of items)	Custodial	Conditional	Probation	Total
Overall (43)	.899	.892	.878	.919
Overall (40)	.885	.884	.867	.911
Criminal History (8)	.745	.834	.813	.869
Education / Employment (9)	.804	.812	.820	.836
Family / Marital (4)	.374	.432	.359	.391
Leisure / Recreation (2)	.334	.393	.360	.427
Companions (4)	.576	.602	.598	.629
Procriminal Attitudes (4)	.527	.569	.551	.603
Substance Abuse (8)	.812	.836	.814	.837
Antisocial Pattern (4)	.520	.338	.359	.513

*=<.05, **=<.01, ***=<.001

3.4.1. Summary

This first series of analyses examined the internal consistency of the LSI-OR and its ability to predict recidivism, using Cronbach's alpha. When analyzed as a whole, it was found that there was a strong alpha for the 43 item LSI-OR and the 40 item LSI-OR. When looking at the individual subscales, those with four or fewer items had low alphas (.600 or lower) where the larger subscales all had alpha levels above .800. When separating for gender, both males and females had results similar to those found in the overall sample. Finally, when separating for

gender and race, these results remained relatively consistent, with the exception of the Leisure/Recreation variable, which had negative alpha values for Aboriginal, Black and Other females who were released from a custodial sentence.

3.5. LSI-OR Total Scores

LSI-OR scores ranged from 0 to 43 with an average of 12.41 (SD=8.767) across all groups. A 3x4 ANOVA was conducted with disposition type and racial group as independent variables and LSI-OR total score as the dependent variable. There was a significant main effect for race, F (4, 26435) = 512.688, p <.001, and disposition, F (2, 26435) = 2150, p <.001. Since Levene's Test was significant, F (14, 26435) = 72.542, p <.001, the Dunnett's C post hoc was performed. LSI-OR scores for each racial category were significantly different from each other. Aboriginal offenders (M=20.66, SD=9.62) had significantly higher LSI-OR scores than Caucasian offenders (M=13.50, SD=8.71), Black offenders (M=12.44, SD=8.38), Other offenders (M=9.08, SD=7.07) and Unknown offenders (M=7.48, SD=5.722) offenders. The Cohen's d and effect size for LSI-OR score differences between races are presented in Table 5.

Table 5. Cohen's d and effect size for LSI-OR score differences between races

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	20.66(9.62)	Black	12.44(8.38)	0.911	0.415
Aboriginal	20.66(9.62)	Caucasian	13.50(8.71)	0.780	0.363
Aboriginal	20.66(9.62)	Other	9.08(7.07)	1.372	0.566
Aboriginal	20.66(9.62)	Unknown	7.48(5.722)	1.665	0.640
Black	12.44(8.38)	Caucasian	13.50(8.71)	-0.124	-0.062
Black	12.44(8.38)	Other	9.08(7.07)	0.433	0.212
Black	12.44(8.38)	Unknown	7.48(5.722)	0.691	0.327
Caucasian	13.50(8.71)	Other	9.08(7.07)	0.557	0.268
Caucasian	13.50(8.71)	Unknown	7.48(5.722)	0.815	0.377
Other	9.08(7.07)	Unknown	7.48(5.722)	0.248	0.123

The LSI-OR scores for each disposition category were all significantly different from each other. Offenders with a custodial sentence (M=22.63, SD=8.410) had a significantly higher LSI-OR score than those on a conditional sentence (M=11.24, SD=7.535; d = 1.427, r = 0.581) and those on probation (M=9.85, SD=6.854; d = 1.666, r = 0.640). Those on a conditional sentence had significantly higher LSI-OR than those on probation (d = 0.193, r = 0.096). Finally, there was also a significant disposition-by-race interaction, F (8, 26435) = 12.03, p<.001. Therefore, the differences in the LSI-OR scores among the three dispositions varied as a function of race. Figure 2 illustrated the estimated marginal means of total LSI-OR score by race

and disposition. Table 6 shows the Mean and LSI-OR score by disposition and racial groups (for gender breakdown, refer to Appendix D). The Cohen's d and effect sizes for LSI-OR score differences between the races can be found in Table 7 for the custodial sample, Table 8 for the conditional sample, and Table 9 for the probation sample.

Figure 2. Estimated marginal means of total LSI-OR score by race and disposition.

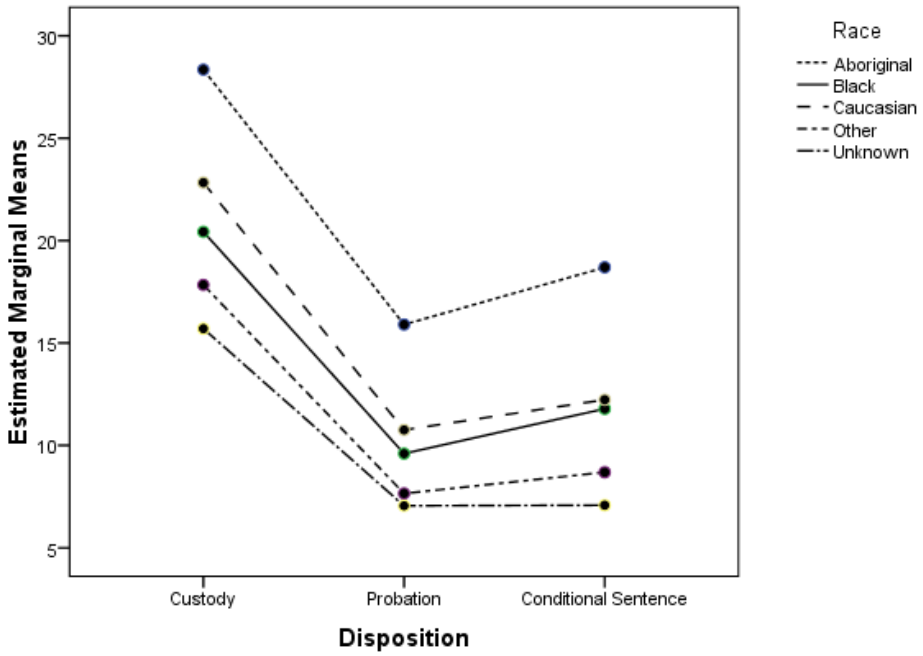


Table 6. Mean LSI-OR score by disposition and racial groups

	Custodial(SD)	**Conditional(SD)**	**Probation(SD)**	**Total (SD)**
Aboriginal	28.35(7.502)	18.70(8.171)	15.90(7.717)	20.66(9.624)
Black	20.43(7.682)	11.79(7.384)	9.60(6.786)	12.44(8.384)
Caucasian	22.83(7.961)	12.23(7.426)	10.76(6.917)	13.50(8.708)
Other	17.84(8.257)	8.69(5.850)	7.66(5.916)	9.08(7.070)
Unknown	15.70(8.232)	7.08(5.597)	7.06(5.164)	7.48(5.722)
Total	22.63(8.410)	11.24(7.535)	9.85(6.854)	12.41(8.767)

Table 7. Cohen's d and effect size for LSI-OR score differences between races for the custodial sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	28.35(7.502)	Black	20.43(7.682)	1.043	0.462
Aboriginal	28.35(7.502)	Caucasian	22.83(7.961)	0.714	0.336
Aboriginal	28.35(7.502)	Other	17.84(8.257)	1.332	0.554
Aboriginal	28.35(7.502)	Unknown	15.70(8.232)	1.606	0.626
Black	20.43(7.682)	Caucasian	22.83(7.961)	-0.307	-0.152
Black	20.43(7.682)	Other	17.84(8.257)	0.325	0.160
Black	20.43(7.682)	Unknown	15.70(8.232)	0.594	0.285
Caucasian	22.83(7.961)	Other	17.84(8.257)	0.615	0.294
Caucasian	22.83(7.961)	Unknown	15.70(8.232)	0.881	0.403
Other	17.84(8.257)	Unknown	15.70(8.232)	0.260	0.129

Table 8. Cohen's d and effect size for LSI-OR score differences between races for the conditional sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	18.70(8.171)	Black	11.79(7.384)	0.887	0.406
Aboriginal	18.70(8.171)	Caucasian	12.23(7.426)	0.829	0.383
Aboriginal	18.70(8.171)	Other	8.69(5.850)	1.409	0.576
Aboriginal	18.70(8.171)	Unknown	7.08(5.597)	1.660	0.638
Black	11.79(7.384)	Caucasian	12.23(7.426)	-0.059	-0.030
Black	11.79(7.384)	Other	8.69(5.850)	0.465	0.227
Black	11.79(7.384)	Unknown	7.08(5.597)	0.719	0.338
Caucasian	12.23(7.426)	Other	8.69(5.850)	0.530	0.256
Caucasian	12.23(7.426)	Unknown	7.08(5.597)	0.783	0.365
Other	8.69(5.850)	Unknown	7.08(5.597)	0.281	0.139

Table 9. Cohen's d and effect size for LSI-OR score differences between races for the probation sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	15.90(7.717)	Black	9.60(6.786)	0.867	0.398
Aboriginal	15.90(7.717)	Caucasian	10.76(6.917)	0.701	0.331
Aboriginal	15.90(7.717)	Other	7.66(5.916)	1.198	0.514
Aboriginal	15.90(7.717)	Unknown	7.06(5.164)	1.346	0.559
Black	9.60(6.786)	Caucasian	10.76(6.917)	-0.169	-0.084
Black	9.60(6.786)	Other	7.66(5.916)	0.305	0.151
Black	9.60(6.786)	Unknown	7.06(5.164)	0.421	0.206
Caucasian	10.76(6.917)	Other	7.66(5.916)	0.482	0.234
Caucasian	10.76(6.917)	Unknown	7.06(5.164)	0.606	0.290
Other	7.66(5.916)	Unknown	7.06(5.164)	0.108	0.054

3.5.1. Summary

This section examined the LSI-OR scores as they relate to gender, ethnicity and disposition. ANOVAs revealed that there was a significant main effect for race where Aboriginal offenders had the highest LSI-OR scores followed by Caucasian and Black offenders. Similarly, there was also a main effect for disposition, where those in custody had the highest LSI-OR total scores, followed by those on a conditional sentence and probation. In addition, it was found that there was an interaction indicating that scores varied with racial categories as a function of disposition. The Cohen's d and effect size can be analyzed to determine the magnitude of the differences between the subgroups. These values are quite large, indicating a large effect size. However, these findings are merely descriptive in nature and do not assess the reliability or validity of the LSI-OR.

3.6. LSI-OR and Index Offence

Pearson correlations were conducted between the OSS and the LSI-OR total score. These correlations were separated by race and disposition in Table 10. There was a significant correlation between an offender's LSI-OR score and the index offence severity (r = .139, p <.001). There was a positive correlation for those on probation (r =.040, p <.001) and custodial sentences (r=.129, p<.001). However, the correlation for the conditional disposition was significantly negative (r=-.041, p=.020). Refer to Appendix E for a breakdown by gender.

Table 10. Pearson correlations for Offence Severity Score and the LSI-OR total score.

	Custodial	**Conditional**	**Probation**	**Total**
Aboriginal	.187***	-.065	.057	.178***
Black	.154**	-.002	.035	.213***
Caucasian	.176***	-.037	.065***	.161***
Other	-.052	-.054	.007	.077***
Unknown	.192**	.033	-.019	.047**
Total	.129***	-.041*	.40***	.139***

*p=.05, **p=.01, ***p<.001

3.6.1. Violent vs. Non-Violent Index Offences

The Offence Severity Scale was then used to classify the index offences as either violent or non-violent. The offences that were classified as "violent offences" from the OSS were: 26. Homicide and related offences, 25. Serious Violent Offences, 24. Violent sexual offences, 22. Non-violent sexual offences, 20. Weapons offences, 18. Miscellaneous offences against the

person, and 16. Assault and related offences. First, a t-test was run to compare the mean LSI-OR score of offenders whose index offence was either violent or non-violent. Levene's test was again found to be significant (F = 522.555, p <.001) so we cannot assume equal variance. There was, however, a significant difference between these two groups on their LSI-OR total score, t (16900) = 21.453, p <.001, indicating that those with a violent index offence had a higher LSI-OR score than those with a non-violent index offence. This was also analyzed by disposition group. Levene's test was not significant for those on a conditional sentence (F = .304, p = .582), and those with a violent index offence had a lower LSI-OR score than those with a non-violent index offence, t (3223) = -2.117, p = .034. Levene's test was significant for the probation sample, (F = 74.817, p <.001) and violent offenders had a significantly higher LSI-OR score than non-violent offenders, t (8351) = 5.209, p <.001. Levene's test was significant for those in the custody sample (F = 17.741, p <.001), and violent offenders had a significantly higher LSI-OR score than non-violent offenders, t (4895) = 8.903, p<.001. Table 11 contains the mean LSI-OR score for violent and non-violent offenders by disposition group.

Table 11. Mean LSI-OR score for violent and non-violent offenders by disposition

	Non-violent (SD)	**Violent (SD)**	**t-score**	**p-value**	**Cohen's *d***	**Effect size *r***
Conditional	11.57(7.493)	11.00(7.560)	-2.117	.034	0.076	0.038
Probation	9.68(6.667)	10.30(7.307)	5.209	<.001	- 0.089	- 0.044
Custodial	21.55(8.624)	23.67(8.066)	8.903	<.001	- 0.254	- 0.126
Total	11.52(8.161)	14.03(9.564)	21.453	<.001	- 0.282	- 0.140

3.6.1.1. Male Offenders: Violent vs. Non-Violent Index Offences

Specifically examining the male clients, t-tests were conducted to compare the mean LSI-OR score of offenders whose index offences were violent or non-violent. Levene's test was significant (F = 465.423 p <.001) so we cannot assume equal variance. There was, however, a significant difference between these two groups on their LSI-OR total score, t (12220) = 26.306, p<.001. This was also analyzed by disposition group. For offenders with a conditional sentence, the Levene's test was not significant (F = 1.042, p = .307), and the LSI-OR score for violent offenders did not differ significantly for those convicted of a non-violent offence (t (2516) = -065, p = .948). Levene's test was significant for the probation sample, (F=69.882, p<.001) and there was a significant difference in LSI-OR scores for those with a violent and a non-violent index offence, t (5230) = 8.646, p<.001. Levene's test was significant for those in the custody sample (F = 17.721, p <.001), and violent offenders given a custodial sentence had a higher

mean LSI-OR score than non-violent offenders, t (4625) = 9.286, p <.001. The t-test statistics for the male sample, by disposition, can be found in Table 12.

Table 12. Mean LSI-OR score for violent and non-violent offenders by disposition for males

	Non-violent (SD)	**Violent (SD)**	**t-score**	**p-value**	**Cohen's *d***	**Effect size *r***
Conditional	11.25(7.420)	11.23(7.554)	-.065	.948	0.003	0.001
Probation	9.57(6.621)	10.78(7.365)	8.646	<.001	- 0.173	- 0.086
Custodial	21.43(8.616)	23.70(8.029)	9.286	<.001	- 0.273	- 0.135
Total	11.60(8.256)	15.13(9.710)	26.306	<.001	- 0.392	-0.192

3.6.1.2. Female Offenders: Violent vs. Non-Violent Index Offences

Specifically examining the female clients, a t-test was run to compare the mean LSI-OR score of offenders whose index offence was violent and non-violent. Levene's test was significant (F = 19.566, p = <.001). Those with violent index offences had significantly lower LSI-OR scores than those with non-violent index offences, t (4680) = -1.972, p =.049. This was further broken down by disposition group. Levene's test was non-significant for those on a conditional sentence (F = .325, p = .569), and there was a significant difference between violent and non-violent index offences on LSI-OR score, t (705) = -4.866, p <.001. Violent offenders with a custodial sentence did not differ on the LSI-OR from non-violent offenders with a custodial sentence (t (293) = -.818, p=.414), the Levene's test was not significant here (F = .001, p = .974). There was also a non-significant Levene's statistic for the probation sample (F = 2.208, p = .137). Violent offenders with probation scored significantly lower on the LSI-OR than non-violent offenders with probation (t (3830) = -4.322, p=.854). The t-test statistics for the female sample, by disposition, can be found in Table 13.

Table 13. Mean LSI-OR score for female violent and non-violent offenders by disposition.

	Non-violent (SD)	**Violent (SD)**	**t-score**	**p-value**	**Cohen's *d***	**Effect size *r***
Conditional	13.51(7.656)	10.41(7.552)	-4.866	<.001	0.408	0.200
Probation	10.23(6.869)	9.25(7.069)	-4.322	<.001	0.141	0.070
Custodial	24.12(8.425)	23.28(8.540)	-.818	.414	0.099	0.049
Total	11.09(7.583)	10.64(8.221)	-1.972	.049	0.057	0.028

3.6.2. Summary

This section examined the index offence. The correlations between the OSS and the LSI-OR score were relatively weak for the total sample. When broken down by disposition and gender, few correlations were significant, and many were actually negative. When examining the LSI-OR scores of those with violent and non-violent index offences. T-tests found the LSI-OR

scores to be significantly higher for the violent offenders than the non-violent offenders in terms of index offence. For the total sample, and the males, this was true for all dispositions except those on a conditional sentence. When looking at the females, those with a non-violent index offence had higher LSI-OR scores in all instances, although only the total sample was significant. The results in this section were not very strong and in some cases opposite of what would be expected. However, this is a postdictive analysis and does not speak to the predictive validity of the LSI-OR.

3.7. Recidivism

There are numerous ways in which recidivism can be defined. It is often debated whether or not technical offences should be included in the measure of recidivism. When looking at the Offence Severity Scale, items six (parole violations) and ten (breach of court order) are considered technical offences. Some academics argue that only criminal code recidivism should be examined, while others argue that catching offenders on a technical offence could possibly prevent a more serious offence. Thus, both ways have been examined in this current analysis. First, when 309 technical offences were removed to examine only the criminal code offences, the recidivism rate was 33.45% (*N*=8847). Whereas the total recidivism rate including technical offences was 34.6% (N=9156). To determine which measure of recidivism should be used throughout this paper, a number of analyses were conducted with both measures of recidivism. Recidivism rates varied according to disposition group for both samples.

3.7.1. Recidivism with Technical Offences

A 3x4 ANOVA was conducted with disposition and race as independent factors and recidivism (yes, no) as the dependent factor. Recidivists were coded with a "1" and non-recidivists were coded "0", creating data to be used in quantitative analyses, allowing for easy interpretation with mean value that were the same as frequencies. There was a significant main effect for disposition, F (2, 26435) = 304.946, p <.001. Since Levene's test was significant, F (14, 26435) = 457.484, p <.001, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate (62.2%) than those placed on probation (28.2%) and those placed on a conditional sentence (27.5%). There was no significant difference in the recidivism rates of those on probation or on a conditional sentence. There was, however, a significant main effect for race, F (4, 26435) = 151.070, p

<.001. When looking into the simple main effects for race, the Dunnett's C post hoc was again used. Aboriginal offenders were found to recidiviate more than Black, Caucasian, Other and Unknown offenders. The difference between all racial groups was significant. Finally, there was also a significant disposition-by-race interaction, F (8, 26435) = 3.167, p = .001, therefore, the differences in the rates of recidivism among the three dispositions vary as a function of race.

The univariate tests showed that there was a significant difference among dispositions for Aboriginal offenders, F (2, 26435) = 72.512, p <.001, Black offenders, F (2, 26435) = 69.752, p <.001, Caucasian offenders, F (2, 26435) = 631.115, p<.001, Other offenders, F (2, 26435) = 45.949, p<.001, and Unknown offenders, F (2, 26435) = 19.842, p <.001. Similarly, there was also a significant difference of race for custodial sentences, F (4, 26435) = 47.581, p <.001, probation, F (4, 26435) = 200.440, p<.001, and for conditional sentences, F (4, 26435) = 38.015, p<.001. The mean recidivism rates by race and disposition are plotted in Figure 3. The means and standard deviations for recidivism rate by disposition and racial groups can be found in Table 14, and the Cohen's d and effect size for recidivism rate score differences between races for the total sample can be found in Table 15.

Aboriginal offenders in custody reoffended significantly more than Black, Caucasian, Other and Unknown offenders. Black offenders recidivated significantly more than Other and Unknown offenders, Caucasian offenders reoffended more than Other and Unknown offenders, and Other offenders reoffended significantly more than Unknown offenders. Cohen's d and effect size for recidivism rate score differences between races for the custodial sample can be found in Table 16.

For those on a conditional sentence, Aboriginal offenders recidivated more than Caucasian, Other and Unknown offenders. Black offenders recidivated more than Caucasian, Other and Unknown offenders, and Other offenders recidivated more than Unknown offenders. Cohen's d and effect size for recidivism rate score differences between races for the conditional sentence sample can be found in Table 17.

When examining those on probation, Aboriginal offenders reoffended significantly more than Black, Caucasian, Other and Unknown offenders. Black offenders recidivated significantly more than Caucasian, Other and Unknown offenders, Caucasian offenders reoffended more than Other and Unknown offenders, and Other offenders reoffended significantly more than Unknown

offenders. Cohen's d and effect size for recidivism rate score differences between races for the probation sample can be found in Table 18.

Figure 3. Estimated marginal means of recidivism rate for race by disposition.

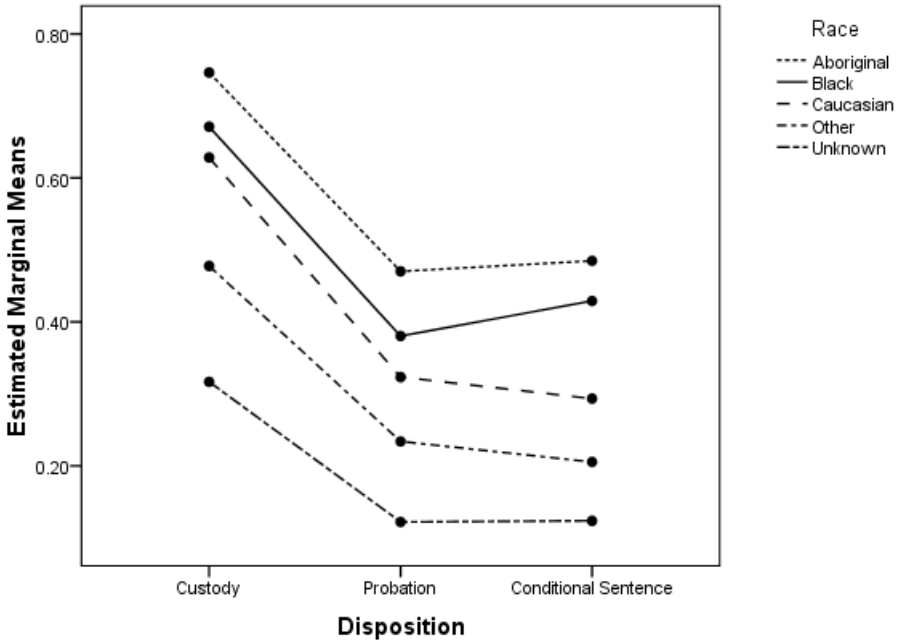


Table 14. Mean and SD for recidivism rate by disposition and racial groups

	Custodial(SD)	**Conditional(SD)**	**Probation(SD)**	**Total (SD)**
Aboriginal	0.746(0.436)	0.485(0.501)	0.470(0.499)	0.570(0.495)
Black	0.671(0.470)	0.429(0.496)	0.380(0.486)	0.455(0.498)
Caucasian	0.628(0.483)	0.293(0.455)	0.323(0.468)	0.385(0.487)
Other	0.478(0.500)	0.205(0.405)	0.234(0.423)	0.260(0.439)
Unknown	0.317(0.466)	0.124(0.330)	0.122(0.327)	0.132(0.338)
Total	0.622(0.485)	0.275(0.447)	0.284(0.451)	0.346(0.476)

Table 15. Cohen's d and effect size for recidivism rate score differences between races for the total sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.570(0.495)	Black	0.455(0.498)	0.232	0.115
Aboriginal	0.570(0.495)	Caucasian	0.385(0.487)	0.377	0.185
Aboriginal	0.570(0.495)	Other	0.260(0.439)	0.663	0.314
Aboriginal	0.570(0.495)	Unknown	0.132(0.338)	1.033	0.459
Black	0.455(0.498)	Caucasian	0.385(0.487)	0.142	0.071
Black	0.455(0.498)	Other	0.260(0.439)	0.415	0.203
Black	0.455(0.498)	Unknown	0.132(0.338)	0.759	0.354
Caucasian	0.385(0.487)	Other	0.260(0.439)	0.270	0.134
Caucasian	0.385(0.487)	Unknown	0.132(0.338)	0.604	0.289
Other	0.260(0.439)	Unknown	0.132(0.338)	0.327	0.161

Table 16. Cohen's d and effect size for recidivism rate score differences between races for the custodial sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.746(0.436)	Black	0.671(0.470)	0.165	0.082
Aboriginal	0.746(0.436)	Caucasian	0.628(0.483)	0.256	0.127
Aboriginal	0.746(0.436)	Other	0.478(0.500)	0.571	0.275
Aboriginal	0.746(0.436)	Unknown	0.317(0.466)	0.951	0.429
Black	0.671(0.470)	Caucasian	0.628(0.483)	0.090	0.045
Black	0.671(0.470)	Other	0.478(0.500)	0.398	0.195
Black	0.671(0.470)	Unknown	0.317(0.466)	0.756	0.354
Caucasian	0.628(0.483)	Other	0.478(0.500)	0.305	0.151
Caucasian	0.628(0.483)	Unknown	0.317(0.466)	0.655	0.311
Other	0.478(0.500)	Unknown	0.317(0.466)	0.333	0.164

Table 17. Cohen's d and effect size for recidivism rate score differences between races for the conditional sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.485(0.501)	Black	0.429(0.496)	0.112	0.056
Aboriginal	0.485(0.501)	Caucasian	0.293(0.455)	0.401	0.197
Aboriginal	0.485(0.501)	Other	0.205(0.405)	0.615	0.294
Aboriginal	0.485(0.501)	Unknown	0.124(0.330)	0.851	0.392
Black	0.429(0.496)	Caucasian	0.293(0.455)	0.286	0.141
Black	0.429(0.496)	Other	0.205(0.405)	0.495	0.240
Black	0.429(0.496)	Unknown	0.124(0.330)	0.724	0.340
Caucasian	0.293(0.455)	Other	0.205(0.405)	0.204	0.102
Caucasian	0.293(0.455)	Unknown	0.124(0.330)	0.425	0.208
Other	0.205(0.405)	Unknown	0.124(0.330)	0.219	0.109

Table 18. Cohen's d and effect size for recidivism rate score differences between races for the probation sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.470(0.499)	Black	0.380(0.486)	0.183	0.091
Aboriginal	0.470(0.499)	Caucasian	0.323(0.468)	0.304	0.150
Aboriginal	0.470(0.499)	Other	0.234(0.423)	0.510	0.247
Aboriginal	0.470(0.499)	Unknown	0.122(0.327)	0.825	0.381
Black	0.380(0.486)	Caucasian	0.323(0.468)	0.119	0.060
Black	0.380(0.486)	Other	0.234(0.423)	0.320	0.158
Black	0.380(0.486)	Unknown	0.122(0.327)	0.623	0.297
Caucasian	0.323(0.468)	Other	0.234(0.423)	0.200	0.099
Caucasian	0.323(0.468)	Unknown	0.122(0.327)	0.498	0.242
Other	0.234(0.423)	Unknown	0.122(0.327)	0.296	0.147

3.7.2. Criminal Code Recidivism

This 3x4 ANOVA was rerun with technical offences counting as a non-offence. As in the previous analysis, disposition and race were entered as the independent factors and dichotomous (yes/no) recidivism as the dependent factor. The results of the current analysis were almost identical to the previous ANOVA results. Again, there was a significant main effect for Disposition, F (2, 26435) = 265.402, p <.001, and the Dunnett's C post hoc showed that those placed on a custodial sentence were more likely to recidivate than those placed on probation and those placed on a conditional sentence. There was no significant difference on the recidivism rate of those on probation or on a conditional sentence. There was also a significant main effect for race, F (4, 26435) = 145.212, p <.001. Dunnett's C post hoc found that Aboriginal offenders were more likely to recidiviate more than Black, Caucasian, Other and Unknown offenders. The differences between all of these racial groups were significant. Finally, there was also a significant disposition-by-race interaction, F (8, 26435) = 3.127, p=.002, therefore, the differences in the rates of recidivism among the three dispositions vary as a function of race. The differences in recidivism rates by gender, ethnicity and disposition for each definition of recidivism can be found in Table 19. These results were virtually the same without the inclusion of technical violations, with reduced F values, and a reduced p value for the interaction. Mean recidivism rates by disposition and race are presented in Table 4. The Cohen's d and effect size for recidivism rate score differences between races for the total sample can be found in Table 20. The Cohen's d and effect sizes are then presented by disposition: custodial offenders are presented in Table 21; conditional offenders in Table 22; and probation offenders in Table 23.

Figure 4. Estimated marginal means of recidivism with technical offences removed for gender by disposition.

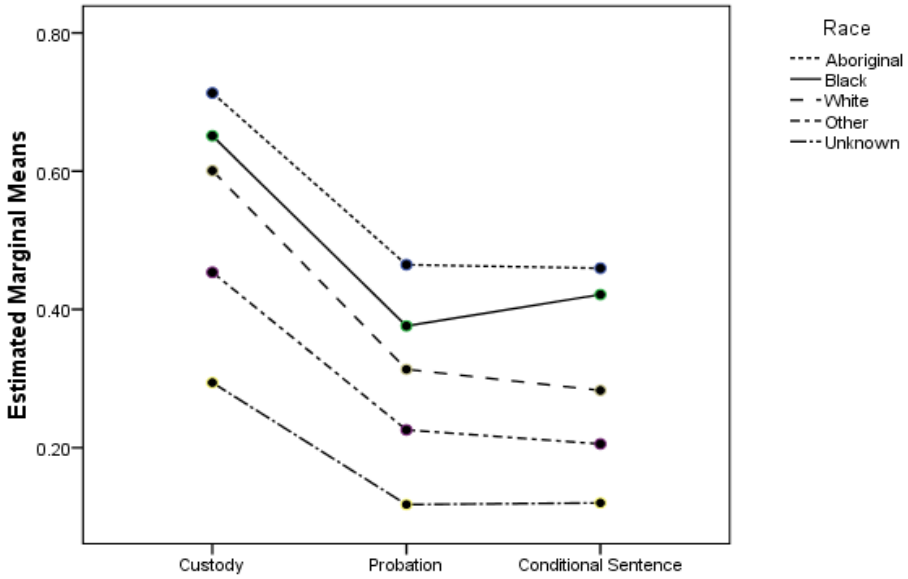


Table 19. Mean and LSI-OR score by disposition and racial groups

	Custodial(SD)	**Conditional(SD)**	**Probation(SD)**	**Total (SD)**
Aboriginal	0.713(0.453)	0.460(0.500)	0.465(0.499)	0.497(0.553)
Black	0.651(0.477)	0.422(0.495)	0.376(0.485)	0.447(0.497)
Caucasian	0.601(0.490)	0.283(0.451)	0.313(0.464)	0.371(0.483)
Other	0.454(0.499)	0.205(0.405)	0.226(0.418)	0.251(0.434)
Unknown	0.294(0.457)	0.120(0.325)	0.118(0.322)	0.127(0.333)
Total	0.595(0.491)	0.267(0.442)	0.276(0.447)	0.334(0.472)

Table 20. Cohen's d and effect size for recidivism rate score differences between races for the total sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.497(0.553)	Black	0.447(0.497)	0.095	0.047
Aboriginal	0.497(0.553)	Caucasian	0.371(0.483)	0.243	0.120
Aboriginal	0.497(0.553)	Other	0.251(0.434)	0.495	0.240
Aboriginal	0.497(0.553)	Unknown	0.127(0.333)	0.811	0.376
Black	0.447(0.497)	Caucasian	0.371(0.483)	0.155	0.077
Black	0.447(0.497)	Other	0.251(0.434)	0. 420	0.206
Black	0.447(0.497)	Unknown	0.127(0.333)	0.756	0.354
Caucasian	0.371(0.483)	Other	0.251(0.434)	0.261	0.130
Caucasian	0.371(0.483)	Unknown	0.127(0.333)	0.588	0.282
Other	0.251(0.434)	Unknown	0.127(0.333)	0.321	0.158

Table 21. Cohen's d and effect size for recidivism rate score differences between races for the custodial sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.713(0.453)	Black	0.651(0.477)	0.144	0.066
Aboriginal	0.713(0.453)	Caucasian	0.601(0.490)	0.237	0.118
Aboriginal	0.713(0.453)	Other	0.454(0.499)	0.543	0.262
Aboriginal	0.713(0.453)	Unknown	0.294(0.457)	0.921	0.418
Black	0.651(0.477)	Caucasian	0.601(0.490)	0.103	0.052
Black	0.651(0.477)	Other	0.454(0.499)	0.404	0.198
Black	0.651(0.477)	Unknown	0.294(0.457)	0.764	0.357
Caucasian	0.601(0.490)	Other	0.454(0.499)	0.297	0.147
Caucasian	0.601(0.490)	Unknown	0.294(0.457)	0.648	0.308
Other	0.454(0.499)	Unknown	0.294(0.457)	0.334	0.165

Table 22. Cohen's d and effect size for recidivism rate score differences between races for the conditional sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.460(0.500)	Black	0.422(0.495)	0.076	0.038
Aboriginal	0.460(0.500)	Caucasian	0.283(0.451)	0.372	0.183
Aboriginal	0.460(0.500)	Other	0.205(0.405)	0.560	0.270
Aboriginal	0.460(0.500)	Unknown	0.120(0.325)	0.806	0.374
Black	0.422(0.495)	Caucasian	0.283(0.451)	0.294	0.145
Black	0.422(0.495)	Other	0.205(0.405)	0.480	0.233
Black	0.422(0.495)	Unknown	0.120(0.325)	0.721	0.399
Caucasian	0.283(0.451)	Other	0.205(0.405)	0.182	0.091
Caucasian	0.283(0.451)	Unknown	0.120(0.325)	0.415	0.203
Other	0.205(0.405)	Unknown	0.120(0.325)	0.231	0.115

Table 23. Cohen's d and effect size for recidivism rate score differences between races for the probation sample

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	0.465(0.499)	Black	0.376(0.485)	0.181	0.090
Aboriginal	0.465(0.499)	Caucasian	0.313(0.464)	0.315	0.156
Aboriginal	0.465(0.499)	Other	0.226(0.418)	0.519	0.251
Aboriginal	0.465(0.499)	Unknown	0.118(0.322)	0.826	0.382
Black	0.376(0.485)	Caucasian	0.313(0.464)	0.133	0.066
Black	0.376(0.485)	Other	0.226(0.418)	0.331	0.163
Black	0.376(0.485)	Unknown	0.118(0.322)	0.627	0.299
Caucasian	0.313(0.464)	Other	0.226(0.418)	0.197	0.098
Caucasian	0.313(0.464)	Unknown	0.118(0.322)	0.488	0.237
Other	0.226(0.418)	Unknown	0.118(0.322)	0.289	0.143

In order to examine the two definitions of recidivism, the recidivism rates for the "all recidivism" and the "total criminal code offences" are presented in Table 24.

Table 24. Recidivism rates by gender, race and disposition for both definitions of recidivism

	All Recidivism						Total Criminal Code Offences					
	Total	**Aboriginal**	**Black**	**Caucasian**	**Other**	**Unknown**	**Total**	**Aboriginal**	**Black**	**Caucasian**	**Other**	**Unknown**
Total	34.6%	57.0%	45.5%	38.5%	26.0%	13.2%	33.4%	55.3%	44.7%	37.1%	25.1%	12.7%
Male	36.3%	60.7%	48.5%	40.0%	27.6%	13.3%	35.0%	58.3%	47.5%	38.5%	26.7%	33.3%
Female	27.2%	45.9%	29.4%	31.3%	15.3%	12.8%	26.7%	45.9%	29.0%	30.6%	14.7%	12.5%
Custodial	62.2%	74.6%	67.1%	62.8%	47.8%	31.7%	59.5%	71.3%	65.1%	49.0%	45.4%	29.4%
Male	62.2%	75.1%	66.6%	62.7%	48.6%	30.3%	59.4%	71.6%	64.5%	59.9%	46.1%	28.36%
Female	62.7%	68.2%	81.2%	64.2%	28.6%	45.0%	61.0%	68.2%	81.2%	62.2%	28.6%	40.0%
Conditional	27.5%	48.5%	42.9%	29.3%	20.5%	12.4%	26.7%	46.0%	42.2%	28.3%	20.5%	12.0%
Male	27.9%	48.5%	45.9%	29.7%	21.8%	11.6%	27.0%	44.7%	45.4%	28.6%	21.8%	11.4%
Female	26.2%	48.5%	30.8%	28.1%	13.8%	14.7%	25.5%	48.5%	28.8%	27.3%	13.8%	14.0%
Probation	28.2%	47.0%	38.0%	32.3%	23.4%	12.2%	27.6%	46.5%	37.6%	31.3%	22.6%	11.8%
Male	29.4%	49.6%	41.0%	33.2%	24.8%	12.4%	28.5%	48.7%	40.4%	32.1%	23.9%	11.82%
Female	24.6%	42.2%	25.4%	28.7%	15.0%	11.8%	24.2%	42.2%	25.4%	28.2%	14.2%	11.7%

3.7.3. Summary

This section examined multiple definitions of recidivism. Two measures were examined; recidivism with technical offences, and recidivism without technical offences. There were significant differences between the recidivism rates of the different subgroups of gender, ethnicity and disposition. Aboriginal offenders had the highest rates of recidivism followed by Black and Caucasian offenders. Males recidivated more than females, and those from custody recidivated more than conditional sentence and probation. The Cohen's d and effect size measures can be examined to determine the magnitude of differences between the subgroups. The effect size is a helpful measure since it can be converted to a percentage for ease of interpretation since dichotomous variables were used. These recidivism variables were examined in more detail in the next section to examine the predictive validity of the LSI-OR.

3.8. LSI-OR and Recidivism

To further examine these two different definitions of recidivism, the correlations between the LSI-OR and recidivism were examined for each definition. This analysis looked into the LSI-OR's ability at predicting general recidivism, non-recidivists were assigned the value of 0 and recidivists were assigned the value of 1. In terms of the technical offence as recidivism sample, there was a positive correlation between LSI-OR total score and recidivism ($r = .441$, $p < .001$), indicating that those with a higher LSI-OR score were more likely to recidivate. Similarly, when looking at the criminal code offence only sample, there was a positive correlation between the LSI-OR total score and recidivism, ($r = .436$, $p < .001$). This was also true when broken down by disposition.

3.8.1. LSI-OR Correlations with Violent Recidivism

To further examine this relationship, these analyses were rerun using the entire sample. Violent recidivists were coded with a 1 and all other offenders were coded with 0, therefore, to include non-violent offenders and those who did not reoffend. A positive relationship would suggest that as LSI-OR scores increase, so does the likelihood of committing a violent reoffence. In this set of correlations, the whole sample demonstrated a positive relationship with violent reoffence. Similarly, as expected there was a negative relationship between the "Strength" variables and violent recidivism. This same pattern exists when examining disposition and race.

Correlations comparing all three of these recidivism definitions can be found in Table 25 for disposition, Table 26 for race and Table 27 for gender.

Due to the high correlations with the technical offences included in the definition of recidivism, this is the variable used in all further analyses regarding recidivism, unless otherwise specified. Refer to Appendix F for the correlations between the LSI-OR and recidivism with technical offences by gender and race, and the analysis to determine significant differences between these correlations for gender and race.

Table 25. Correlations between LSI-OR total scores and recidivism by disposition

	All Recidivism				Total Criminal Code Offences				Violent Recidivism			
	Total (n=26450)	Custody (n=4950)	Conditional (n=3225)	Probation (n=18275)	Total (n=26450)	Custody (n=4950)	Conditional (n=3225)	Probation (n=18275)	Total (n=26450)	Custody (n=4950)	Conditional (n=3225)	Probation (n=18275)
Total Section A	.441***	.382***	.417***	.340***	.436***	.391***	.412***	.340***	.286***	.237***	.290***	.174***
Total Strengths	-.118***	-.069***	-.093***	-.079***	-.115***	-.069***	-.093***	-.078***	-.074***	-.061***	-.043*	-.042***
Criminal History	.418***	.420***	.405***	.289***	.408***	.417***	.396***	.285***	.280***	.266***	.265***	.155***
Education/ Employment	.312***	.252***	.268***	.227***	.313***	.266***	.270***	.230***	.220***	.168***	.207***	.148***
Family/Marital	.175***	.153***	.164***	.115***	.177***	.166***	.165***	.117***	.100***	.077***	.112***	.046***
Leisure/ Recreation	.252***	.204***	.179***	.164***	.250***	.213***	.178***	.165***	.168***	.141***	.113***	.093***
Companions	.318***	.271***	.267***	.231***	.317***	.280***	.262***	.233***	.225***	.185***	.209***	.147***
Procriminal Attitudes	.250***	.203***	.181***	.147***	.248***	.216***	.182***	.146***	.153***	.123***	.120***	.050***
Substance Abuse	.297***	.228***	.259***	.214***	.290***	.225***	.248***	.211***	.162***	.123***	.162***	.069***
Antisocial Patterns	.337***	.309***	.288***	.218***	.337***	.322***	.289***	.220***	.227**	.199***	.225	.103***
Total Section B	.327***	.272***	.274***	.202***	.323***	.283***	.266***	.201***	.157***	.078***	.125***	.036***
Personal Problems	.311***	.250***	.251***	.196***	.311***	.268***	.247***	.197***	.164***	.092***	.147***	.055***
Perpetration History	.248***	.213***	.204***	.123***	.239***	.211***	.192***	.119***	.096***	.033*	.051**	-.009
Total Section C	.284***	.228***	.171***	.104***	.276***	.230***	.163***	.102***	.210***	.136***	.143***	.057***
Total Section F	.209***	.158***	.138***	.122***	.211***	.175***	.136***	.125***	.148***	.084***	.126***	.080***
Social, Health, Mental Health	.186***	.142***	.131***	.119***	.189***	.157***	.130***	.122***	.131***	.074***	.121***	.079***
Barrier to Release	.226***	.119***	.128***	.074***	.223***	.132***	.126***	.074***	.164***	.067***	.095***	.030***
Total Section G	.190***	.142***	.104***	.109***	.189***	.149***	.106***	.109***	.096***	.037**	.056**	.027***

*p=.05, **p=.01, ***p<.001

Table 26. Correlations between LSI-OR total scores and recidivism by race

	All Recidivism			Total Criminal Code Offences			Violent Recidivism		
	Aboriginal (n=1692)	Black (n=1918)	Caucasian (n=15646)	Aboriginal (n=1692)	Black (n=1918)	Caucasian (n=15646)	Aboriginal (n=1692)	Black (n=1918)	Caucasian (n=15646)
Total Section A	.377***	.420***	.417***	.374***	.415***	.413***	.174***	.272***	.302***
Total Strengths	-.139***	-.078**	-.123***	-.127***	-.077***	-.120***	-.070**	-.028	-.081***
Criminal History	.354***	.393***	.392***	.339***	.388***	.381***	.216***	.260***	.283***
Education/Employment	.268***	.302***	.295***	.270***	.300***	.298***	.131***	.198***	.238***
Family/Marital	.135***	.152***	.152***	.139***	.150***	.155***	.047	.104***	.098***
Leisure/Recreation	.230***	.243***	.246***	.217***	.239***	.246***	.118***	.128***	.181***
Companions	.240***	.292***	.300***	.249***	.289***	.298***	.114***	.217***	.235***
Procriminal Attitudes	.264***	.234***	.228***	.265***	.232***	.228***	.106***	.134***	.153***
Substance Abuse	.280***	.255***	.275***	.278***	.252***	.267***	.068**	.155***	.174***
Antisocial Patterns	.318***	.318***	.319***	.321***	.316***	.320***	.164***	.220***	.234***
Total Section B	.300***	.289***	.303***	.301***	.288***	.299***	.099***	.157***	.158***
Personal Problems	.298***	.275***	.293***	.300***	.274***	.294***	.101***	.146***	.171***
Perpetration History	.229***	.217***	.214***	.227***	.216***	.204***	.072**	.123***	.084***
Total Section C	.251***	.220***	.270***	.247***	.213***	.261***	.160***	.174***	.218***
Total Section F	.199***	.209***	.185***	.204***	.207***	.189***	.105***	.121***	.153***
Social, Health, Mental Health	.171***	.191***	.163***	.175***	.188***	.168***	.094***	.106***	.134***
Barrier to Release	.251***	.152***	.208***	.250***	.155***	.204***	.105***	.107***	.180***
Total Section G	.221***	.183***	.174***	.222***	.180***	.174***	.083***	.082***	.104***

*p=.05, **p=.01, ***p<.001

Table 27. Correlations between LSI-OR total scores and recidivism by gender

	All Recidivism		**Total Criminal Code Offences**		**Violent Recidivism**	
	Male (n=21616)	Female (n=4834)	Male (n=21616)	Female (n=4834)	Male (n=21616)	Female (n=4834)
Total Section A	.439***	.426***	.434***	.423***	.296***	.246***
Total Strengths	-.117***	-.107***	-.114***	-.106***	-.078***	-.061***
Criminal History	.420***	.372***	.409***	.369***	.291***	.254***
Education/Employment	.320***	.294***	.321***	.292***	.232***	.167***
Family/Marital	.184***	.186***	.185***	.187***	.097***	.114***
Leisure/Recreation	.256***	.211***	.255***	.208***	.180***	.116***
Companions	.322***	.285***	.321***	.284***	.238***	.168***
Procriminal Attitudes	.249***	.218***	.247***	.218***	.160***	.128***
Substance Abuse	.288***	.318***	.280***	.313***	.166***	.148***
Antisocial Patterns	.340***	.289***	.341***	.286***	.240***	.168***
Total Section B	.325***	.299***	.322***	.295***	.166***	.122***
Personal Problems	.307***	.301***	.308***	.297***	.169***	.152***
Perpetration History	.250***	.177***	.242***	.174***	.111***	.024
Total Section C	.290***	.206***	.282***	.205***	.227***	.126***
Total Section F	.225***	.225***	.227***	.224***	.152***	.142***
Social, Health, Mental Health	.202***	.214***	.204***	.213***	.133***	.133***
Barrier to Release	.224***	.209***	.222***	.210***	.170***	.146***
Total Section G	.188***	.163***	.187***	.163***	.099***	.085***

*p=.05, **p=.01, ***p<.001

Finally, a series of correlations were conducted to examine dichotomous recidivism and the LSI-OR, this is presented in Table 28.

Table 28. Correlations between dichotomous recidivism and the LSI-OR risk levels.

	Initial Risk Level	Final Risk Level	Total Score
Entire Sample	.423***	.365***	.441***
Males	.424***	.358***	.439***
Females	.400***	.369***	.426***
Aboriginal	.355***	.344***	.377***
Males	.352***	.335***	.378***
Females	.297***	.304***	.306***
Black	.411***	.350***	.420***
Males	.402***	.326***	.406***
Females	.376***	.386***	.421***
Caucasian	.401***	.351***	.417**
Males	.396***	.341***	.411***
Females	.405***	.377***	.431***
Other	.339**	.252***	.364***
Males	.340***	.246***	.367***
Females	.297***	.240***	.313***
Unknown	.235***	.164***	.250***
Males	.237***	.159***	.249***
Females	.227***	.182***	.255***

*p=.05, **p=.01, ***p<.001

3.8.2. Summary

Correlations between the various definitions of recidivism and the LSI-OR total score and risk levels (for both initial risk level, and final risk level after override) were examined in this section. Analyses showed that there was a significant positive relationship between risk level/score and recidivism regardless of race, ethnicity or disposition. Therefore, the LSI-OR was shown to be a positive predictor of future recidivism for all subgroups. The relationship between the LSI-OR risk levels (initial and override) will be examined in greater detail in subsequent sections.

3.9. Offence Severity: Index vs. Recidivism

A Pearson correlation was conducted between the severity of the index offence and the severity of a reoffence if a reoffence was recorded. Overall, there was a positive relationship between the severity of the index offence and the severity of reoffence (r = .194, p <.001). This was also true for conditional sentence offenders (r = .100, p = .002), probation offenders (r = .153, p <.001), and custodial offenders (r = .203, p <.001). This was also true when looking at the entire male sample, (r = .199, p <.001), male conditional sentence (r = .198, p <.001), male probation (r = .159, p <.001), and male custody (r = .207, p <.001). There was also a positive

correlation for all females (r = 135, p <.001), female conditional sentence, (r = .218, p <.003), female probation (r = .113, p <.001). Females in custody was not significant (r = .112, p = .130).

3.9.1. Summary

Relatively small correlations were found between the severity of the index offense and the severity of the recidivism offence. Correlations were mild, but consistent across all subgroups of offenders. This analysis was exploratory and descriptive in nature and does not reflect on the LSI-OR.

3.10. Binary Logistic Regression

A series of binary logistic regression analyses were conducted in order to determine if dichotomous race influenced recidivism rates. First, the addition of one new variable (Aboriginal vs. non-Aboriginal) to the model, has reduced the -2 log likelihood by 379.071 with 1 degree of freedom. The -2 log likelihood is a measure of how well the model explains variations in the outcome of interest, recidivism. The -2 log likelihood (sometimes called, deviance) has a chi squared distribution. The p value for the result of adding dichotomous Aboriginal ethnicity to the model is p<.001, thus, it appears as though dichotomous Aboriginal ethnicity is statistically significant and can explain variations in recidivism (between 1.4 and 2.0%). The estimated model is: Logit(recidivism) = .283 + -.988Aboriginal and the coefficient of Aboriginal race was significant (p<.001). This indicated that the Aboriginal clients were .372 times more likely to recidivate than the non-Aboriginal clients. The confidence interval for exp(β) is .337 to .412 which indicates that Aboriginals are between .337 and .412 times as likely to recidivate than non-Aboriginals. Next, an additional variable was added to the model – total LSI-OR score. This was analyzed using the "block" procedure to determine if both ethnicity and LSI-OR total score explain variations in recidivism. The addition of the LSI-OR total score to the model (as a single variable) reduced the -2 log likelihood by 4912.336 and 1 degree of freedom. The model now contains two parameters and has collectively reduced -2 log likelihood by 5291.407. Thus, we can see that LSI-OR has the explanatory power above and beyond that of Aboriginal ethnicity. The model which includes Aboriginal race and LSI-OR explains between 18.1 and 25.0% of the variation in recidivism. This new model is: logit(recidivism) = -2.026 -.154Aboriginal +.116TotalScore. The Aboriginal coefficient is statistically significant (p=.008). Exp(β) for Aboriginal was .557 (CI: .765 - .961). Total Score variable was also statistically significant.

Exp(β) for Total score was 1.123 (CI: 1.119 – 1.127), which means that for each point increase on LSI-OR score, the person is 1.123 times more likely to recidivate, having allowed for race in the model. The Aboriginal binary logistic regression variables are presented in Table 29. This analysis was repeated for Black race (Table 30) and Caucasian race (Table 31).

Table 29. Binary Logistic Regression - Aboriginal

	-2 log likelihood	**Df**	**P value**	**Variance**	**Estimated Model**	**exp(β)**	**CI**
Block 1	379.071	1	<.001	.014-.020	Logit(recidivism) = .283 + -.988Aboriginal	.372	.337-.412
Block 2	4912.336	1	.008	.181-.250	Logit(recidivism) = -2.026 - .154Aboriginal +.116TotalScore	.557	.765- .961
	5291.407					1.123	1.119-1.127

A second binary logistic regression was conducted in order to determine if dichotomous race influenced recidivism rates. Black clients were .610 times more likely to recidivate than the non-Black clients. The confidence interval for exp(β) was .556 - .670 which indicated that Blacks are between .556 and .670 times as likely to recidivate than non-Black. We can see that LSI-OR has the explanatory power above and beyond that of Black ethnicity. The model which includes Black race and LSI-OR explains between 18.5 and 25.5% of the variation in recidivism. For each point increase on LSI-OR score, the person is 1.124 times more likely to recidivate, having allowed for race in the model.

Table 30. Binary Logistic Regression - Black

	-2 log likelihood	**Df**	**P value**	**Variance**	**Estimated Model**	**exp(β)**	**CI**
Block 1	108.552	1	<.001	.004-.005	Logit(recidivism) = -.180 - .494Black	.610	.556-.670
Block 2	5305.800	1	<.001	.185-.255	logit(recidivism) = -1.637 - .600Black +.117TotalScore	.549	.495-.609
	5410.508					1.124	1.120-1.128

A third binary logistic regression was conducted in order to determine if dichotomous race influenced recidivism rates. This indicated that the Caucasian clients were 1.534 times more likely to recidivate than the non-Caucasian clients. The confidence interval for exp(β) was 1.455 – 1.616 which indicated that Caucasians were between 1.455 and 1.616 times as likely to

recidivate than non-Caucasians. We can see that LSI-OR has the explanatory power above and beyond that of Caucasian ethnicity. The model which includes Caucasian race and LSI-OR explains between 18.2 and 25.2% of the variation in recidivism. For each point increase on LSI-OR score, the person is 1.122 times more likely to recidivate, having allowed for race in the model.

Table 31. Binary Logistic Regression – Caucasian

	-2 log likelihood	**Df**	**P value**	**Variance**	**Estimated Model**	**exp(β)**	**CI**
Block 1	258.228	1	<.001	.01-.013	Logit(recidivism) = -.896 +.428Caucasian	1.534	1.455-1.616
Block 2	5065.370	1	<.001	.182-.252	logit(recidivism) = -2.280+.187Caucasian +.115TotalScore.	1.206	1.118-1.616
	5323.598					1.122	1.118-1.126

3.10.1. Summary

In this section, a series of binary logistic regression analyses were conducted in order to determine if dichotomous race influenced recidivism rates. In all three races examined (Aboriginal, Black, Caucasian) the LSI-OR was shown to have explanatory power above and beyond that of dichotomous race.

3.11. Log Odds Ratio

The standard error of the logistic regression estimates were calculated using Equation 11.9 from Fleiss, Levin and Paik (Hanson, Helmus, & Thornton, 2010). In this analysis, logistic regression was utilized in order to examine the extent to which the variation across samples could be attributed to different recidivism base rates. The same method employed by Hanson et al. (2010) was used. The predictor variable (β_0) is a measure of the recidivism base rate for each sample (Table 32). This is the log odds of the predicted recidivism rate for offenders with a score of zero. Table 33 presents the comparison between the expected and real outcomes for the complete sample using the logistic regression estimates. This is then presented for males (Table 34), females (Table 35), Aboriginal offenders (Table 36), Aboriginal males (Table 37), Aboriginal females (Table 38), Black offenders (Table 39), Black males (Table 40), Black

females (Table 41), Caucasian offenders (Table 42), Caucasian males (Table 43), and Caucasian females (Table 44).

Table 32. Logistic regression summaries for the prediction of recidivism for the total sample and the subsamples.

Sample	N redic/N	B_0(SE)	B_1(SE)	*r*	Goodness of fit χ^2 (*df*)	*p*
Total	9156/26450	-3.058(.042)	.897(.014)	-.941	13.183(3)	.004
Male	7843/21616	-2.968(.046)	.882(.015)	-.941	13.037(3)	.005
Female	1313/4834	-3.409(.107)	.944(.037)	-.944	1.112(2)	.573
Aboriginal	965/1692	-2.264(.191)	.727(.053)	-.961	2.402(3)	.493
Male	773/1274	-2.206(.228)	.732(.062)	-.963	2.044(2)	.360
Female	192/418	-2.142(.358)	.623(.107)	-.958	.094(3)	.993
Black	873/1918	-2.423(.144)	.862(.052)	-.937	1.403(2)	.496
Male	786/1622	-2.272(.156)	.836(.055)	-.937	2.958(2)	.228
Female	87/296	-2.969(.390)	.891(.148)	-.935	2.104(2)	.349
Caucasian	6024/15646	-.2.866(.056)	.854(.018)	-.947	13.941(3)	.003
Male	5181/12951	-.2.768(.061)	.832(.020)	-.947	15.743(3)	.001
Female	843/2695	-3.287(.143)	.947(.049)	-.948	.272(2)	.873

The following formula can be used to estimate the recidivism rate $\hat{p}$ for a specific LSI-OR score: $\hat{p} = \frac{e^{B0+B1\ x\ Score}}{1 + e^{B0+B1\ x\ Score}}$

The standard error of the logit of $\hat{p}$ is $\sqrt{SE_{B0}^2 + (2\ x\ Score\ x\ r\ x\ SE_{B0}\ x\ SE_{B1}) + [(Score)^2\ x\ SE_{B1}^2]}$

Table 33. Observed and estimated recidivism rates: Complete sample

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	609/5351	11.4%	10.3%
5-10	1676/7797	21.5%	22.0%
11-19	3173/7892	40.2%	40.9%
20-29	2532/3999	63.3%	62.9%
30-43	1166/1411	82.6%	80.6%
Total	9156/26450	34.62%	

Table 34. Observed and estimated recidivism rates: Males

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	514/4220	12.2%	11.0%
5-10	1396/6173	22.6%	23.1%
11-19	2673/6506	41.1%	42.0%
20-29	2192/3433	63.9%	63.6%
30-43	1068/1284	83.2%	80.9%
Total	7843/21616	36.3%	

Table 35. Observed and estimated recidivism rates: Females

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	95/1131	8.4%	7.8%
5-10	280/1624	17.2%	17.9%
11-19	500/1386	36.1%	36.0%
20-29	340/566	60.1%	59.1%
30-43	98/127	77.2%	78.8%
Total	1313/4834	27.2%	

Table 36. Observed and estimated recidivism rates: Aboriginal

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	13/72	18.1%	17.7%
5-10	66/197	33.5%	30.8%
11-19	256/542	47.2%	47.9%
20-29	321/503	63.8%	65.6%
30-43	309/378	81.7%	79.8%
Total	965/1692	57.0%	

Table 37. Observed and estimated recidivism rates: Aboriginal Males

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	7/39	17.9%	18.6%
5-10	48/133	36.1%	32.3%
11-19	181/371	48.8%	49.8%
20-29	258/394	65.5%	67.3%
30-43	279/337	82.8%	81.1%
Total	773/1274	60.7%	

Table 38. Observed and estimated recidivism rates: Aboriginal Females

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	6/33	18.2%	18.0%
5-10	18/64	28.1%	29.0%
11-19	75/171	43.9%	43.2%
20-29	63/109	57.8%	58.7%
30-43	30/41	73.2%	72.6%
Total	192/418	45.9%	

Table 39. Observed and estimated recidivism rates: Black

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	65/371	17.5%	17.4%
5-10	180/557	32.3%	33.2%
11-19	330/591	55.8%	54.1%
20-29	230/323	71.2%	73.6%
30-43	68/76	89.5%	86.8%
Total	873/1918	45.5%	

Table 40. Observed and estimated recidivism rates: Black Males

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	55/286	19.2%	19.2%
5-10	154/453	34.0%	35.4%
11-19	303/517	58.6%	55.9%
20-29	208/292	71.2%	74.5%
30-43	66/74	89.2%	87.1%
Total	786/1622	48.5%	

Table 41. Observed and estimated recidivism rates: Black Females

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	10/85	11.8%	11.1%
5-10	26/104	25.0%	23.4%
11-19	27/74	36.5%	42.7%
20-29	22/31	71.0%	64.5%
30-43	2/2	100.0%	81.5%
Total	87/296	29.4%	

Table 42. Observed and estimated recidivism rates: Caucasian

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	325/2419	13.4%	11.7%
5-10	1020/4338	23.5%	23.9%
11-19	2145/5192	41.3%	42.5%
20-29	1791/2802	63.9%	63.4%
30-43	743/895	83.0%	80.3%
Total	6024/15646	38.5%	

Table 43. Observed and estimated recidivism rates: Caucasian Males

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	277/1901	14.6%	12.6%
5-10	846/3449	24.5%	24.9%
11-19	1818/4349	41.8%	43.2%
20-29	1561/2436	64.1%	63.6%
30-43	679/816	83.2%	80.1%
Total	5181/12951	40.0%	

Table 44. Observed and estimated recidivism rates: Caucasian Females

Score	Fixed follow-up		Logistic regression estimates
	Recidivists/total	Observed recidivism rate (%)	Predicted recidivism rate
0-4	48/518	9.3%	8.8%
5-10	174/889	19.6%	19.9%
11-19	327/843	38.8%	39.0%
20-29	230/366	62.8%	62.3%
30-43	64/79	81.0%	81.0%
Total	843/2695	31.3%	

3.11.2. Summary

This section shows the logistic regression estimates in order to examine the extent to which the variation across samples could be attributed to different recidivism base rates. The predicted recidivism rate derived from the logistic regression is similar to the rates observed in the sample for all subgroups examined.

3.12. Survival Analyses

A Kaplan-Meier Survival analysis was conducted on all offenders. The follow-up period extended to five years from the day custodial offenders were released from custody, and five years from the day an LSI-OR assessment was completed for the conditional and probation offenders. Therefore, all offenders were censored when they had completed 1825 days (five years) of follow-up. Across all disposition groups, 65.4% (N=17294) of the sample was

censored, indicating that 34.6% of the offenders recidivated within five years. The mean survival time (time to recidivate) for those who reoffended was 586.8 days (SE=4.570, SD=437.253).

3.12.1. Survival Analyses - Disposition

A second Kaplan-Meier survival analysis was performed with the sample broken into disposition groups. A smaller proportion of those with a conditional sentence recidivated (censor rate=72.5%) than offenders on probation (censor rate=71.6%) and a custodial sentence (censor rate=37.8%). Probation offenders had the greatest mean survival rate (645.5 days, SE=6.04, SD=435.21), followed by those on a conditional sentence (642.2 days, SE=16.02, SD=477.37), and finally, the custodial sample had the lowest mean survival rate (472.2 days, SE=7.29, SD=404.86). The mean number of days between release date and reoffence date (if a reoffence was committed) has been presented by disposition in Figure 5. A one-way analysis of variance (ANOVA) with the survival time of reoffending offenders as the dependent variable and disposition as the independent variable showed a significant difference in the mean survival time between disposition groups, (F (2,9153) = 165.493, $p<.001$). The Cohen's d and effect size for survival days, by disposition can be found in Table 45, and the survival curve is presented in Figure 6.

Figure 5. Mean number of days between release date and reoffence date if a reoffence was committed, by disposition.

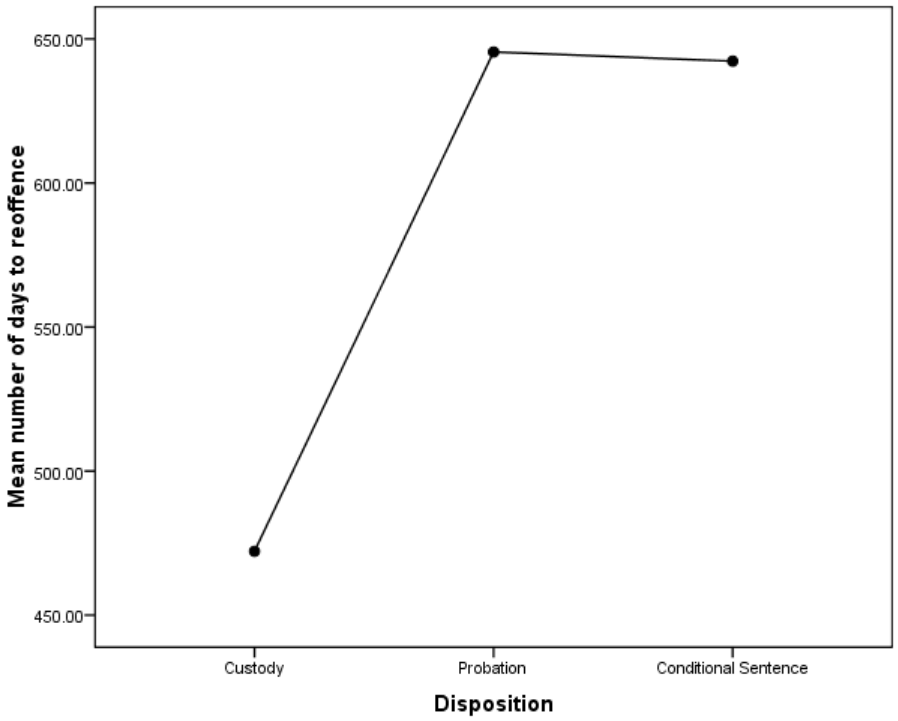
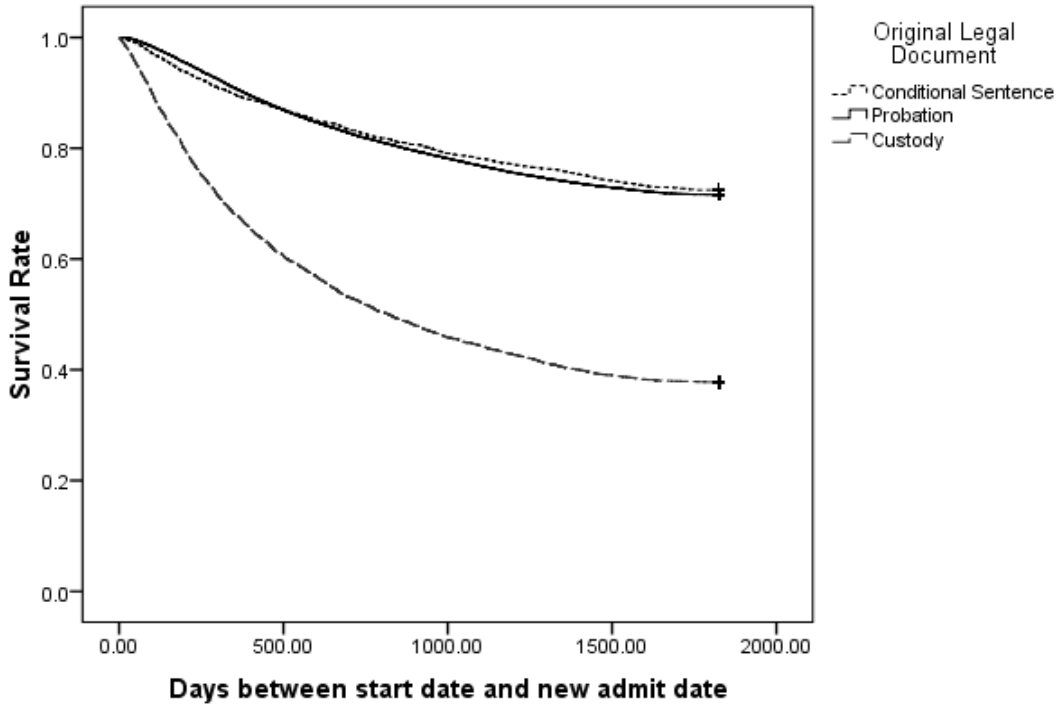


Table 45. Cohen's d and effect size for survival days, by disposition

Disposition	**Mean (SD)**	**Disposition**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Probation	645.5(435.21)	Custodial	472.2(404.86)	0.412	0.202
Probation	645.5(435.21)	Conditional	642.2(477.37)	0.007	0.004
Custodial	472.2(404.86)	Conditional	642.2(477.37)	-0.384	-0.189

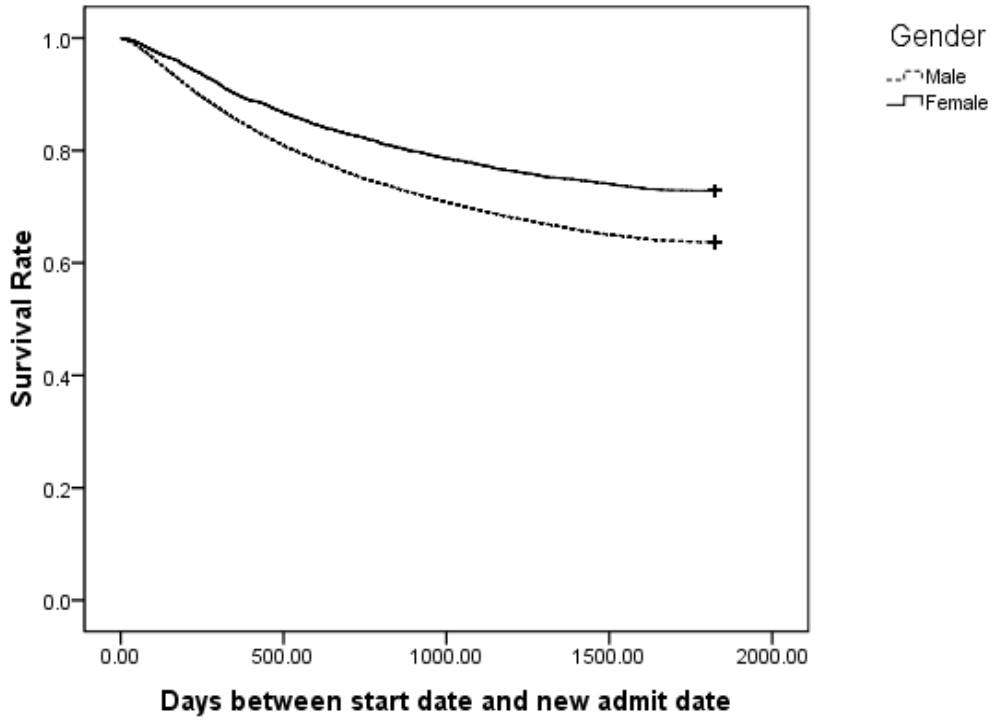
Figure 6. Displays the survival curve separated by disposition.



3.12.2. Survival Analyses - Gender

A third Kaplan-Meier survival analysis was performed with the sample separated by gender. A smaller proportion of females (censor rate=72.8%) recidivated than males (censor rate=63.7%). Female offenders had the greatest mean survival rate (617.1 days, SE=12.04, SD=436.36), followed by males (581.8 days, SE=4.94, SD=437.23; d = 0.081, r = 0.040). The survival curve for gender can be found in Figure 7. Refer to Appendix G for survival curves for gender and disposition.

Figure 7. Displays the survival curve for all offenders by gender.



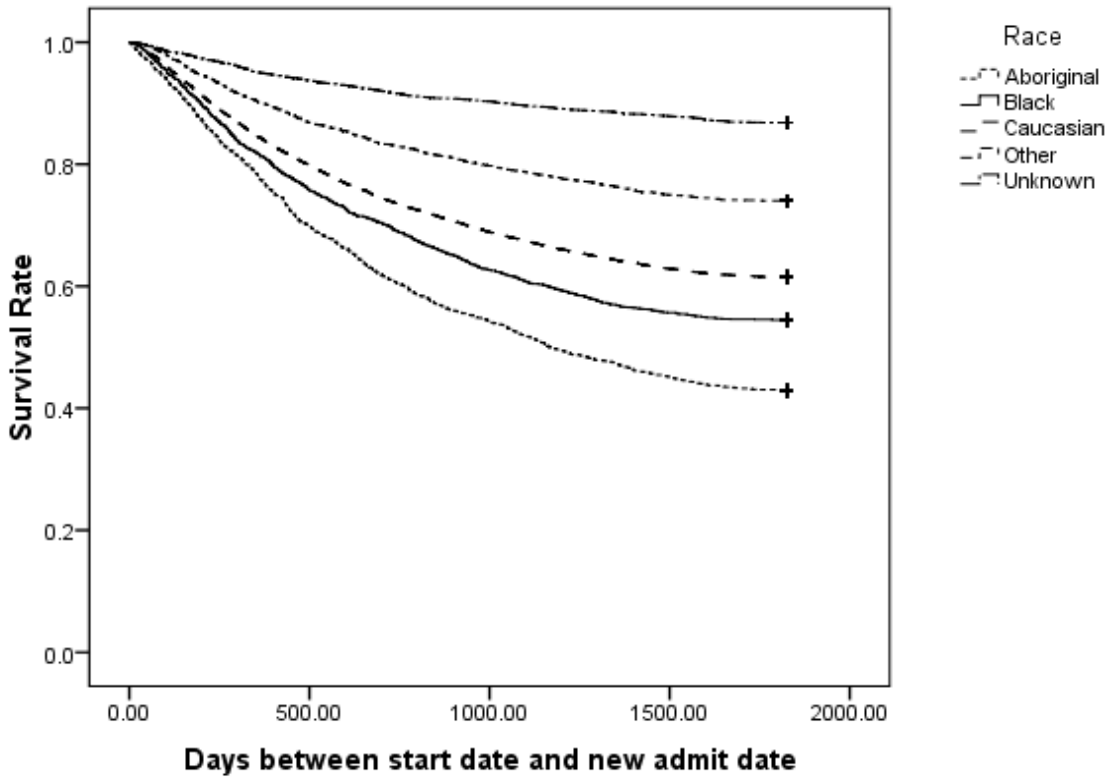
3.12.3. Survival Analyses - Race

A fourth Kaplan-Meier survival analysis was performed with the sample broken into racial groups. A smaller proportion of Unknown race category (censor rate=86.8%) recidivated than the Other group (censor rate=74.0%), the Caucasian group (censor rate=61.5%), the Black group (54.5%) and the Aboriginal group (43.0%). Mean survival days for Aboriginals was the lowest (580 days, SE=13.96, SD=433.67), follow by the Black clients (570 days, SE=14.18, SD=419.08), Caucasian (581 days, SE=5.60, SD=434.35), Other (615 days, SE=16.77, SD=444.06), and Unknown (653 days, SE=19.82, SD=482.60). The Cohen's d and effect size for survival days, by race can be found in Table 46, and the survival curve can be found in Figure 8.

Table 46. Cohen's d and effect size for average survival days differences between races

Race	Mean (SD)	Race	Mean (SD)	Cohen's *d*	Effect Size *r*
Aboriginal	580.3(433.67)	Black	569.9(419.08)	0.024	0.012
Aboriginal	580.3(433.67)	Caucasian	580.6(434.35)	-0.001	-0.000
Aboriginal	580.3(433.67)	Other	615.1(444.06)	-0.079	-0.040
Aboriginal	580.3(433.67)	Unknown	653.1(482.60)	-0.159	-0.079
Black	569.9(419.08)	Caucasian	580.6(434.35)	-0.025	-0.013
Black	569.9(419.08)	Other	615.1(444.06)	-0.105	-0.052
Black	569.9(419.08)	Unknown	653.1(482.60)	-0.184	-0.092
Caucasian	580.6(434.35)	Other	615.1(444.06)	-0.079	-0.039
Caucasian	580.6(434.35)	Unknown	653.1(482.60)	-0.158	-0.079
Other	615.1(444.06)	Unknown	653.1(482.60)	-0.082	-0.041

Figure 8. Displays the survival curve for all offenders by race



3.12.4. Survival Analyses – Risk Level

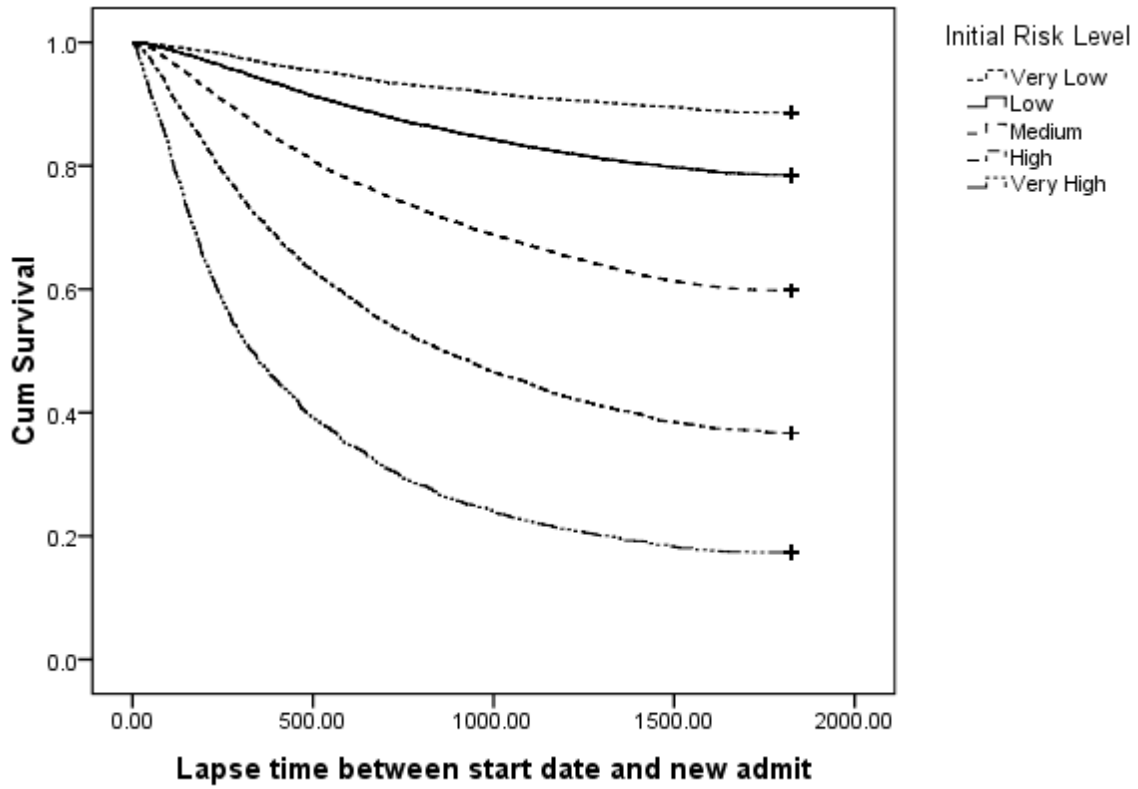
A fifth Kaplan-Meier survival analysis was performed with the sample broken into LSI-OR initial risk levels. A smaller proportion of very low risk category (censor rate=88.6%) recidivated than the low risk (censor rate=78.5%), the medium risk (censor rate=59.8%), the high risk (36.7%) and the very high risk (17.4%). Mean survival days for very high risk was the

lowest (376 days, SE=10.43, SD=356.16), follow by the high risk (525 days, SE=8.31, SD=418.26), medium risk (631 days, SE=7.74, SD=436.22), low risk (699 days, SE=10.87, SD=445.06), and very low risk (710 days, SE=18.47, SD=455.90). The Cohen's d and effect size for the average survival days is presented in Table 47. In Figure 9, the survival curve for all offenders by risk level is shown

Table 47. Cohen's d and effect size for average survival days differences between risk levels

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Very High	376 (356.16)	High	525(418.26)	-0.384	-0.188
Very High	376 (356.16)	Medium	631 (436.22)	-0.640	-0.305
Very High	376 (356.16)	Low	699 (445.06)	-0.801	-0.372
Very High	376 (356.16)	Very Low	710 (455.90)	-0.816	-0.378
High	525 (418.26)	Medium	631 (436.22)	-0.248	-0.123
High	525 (418.26)	Low	699 (445.06)	-0.403	-0.197
High	525 (418.26)	Very Low	710 (455.90)	-0.423	-0.207
Medium	631 (436.22)	Low	699 (445.06)	-0.195	-0.097
Medium	631 (436.22)	Very Low	710 (455.90)	-0.217	-0.108
Low	699 (445.06)	Very Low	710 (455.90)	-0.024	-0.012

Figure 9. Displays the survival curve for all offenders by risk level



3.12.5. Summary

Kaplan-Meier survival analysis were conducted on all offenders with a follow-up period of five years, and then separated for male and female offenders of all races. Through these survival analyses, it can be seen that there are varying rates of recidivism and time to recidivate between different gender, race and disposition groups. One of these differences is that fewer females recidivate than males, with a greater mean survival time. Similarly, recidivism rates differed between dispositions was well, with a one-way ANOVA showing a significant difference in the mean survival time between disposition groups. When separating for gender, these differences still existed, however, the male and female samples had different patterns, showing that the recidivism rates and mean survival days vary by disposition depending on client's gender.

When looking at survival rates and mean days to recidivate for the different racial groups, although the pattern for recidivism rates remained the same when looking at race, gender and disposition, there were differences for the days to recidivate. In particular, when looking at the mean survival days for the three major races, Caucasian males had the highest mean survival rate followed by Black males then Aboriginal males. Females followed the same pattern for recidivism. However, of the three major races, Aboriginal females had the longest mean days to recidivate followed by Caucasian females and then Black females. This is an interesting finding that the Aboriginal males have the shortest time to reconviction, where Aboriginal females have the longest time to recidivate.

3.13. The LSI-OR and Recidivists vs. Non-Recidivists

In order to compare the LSI-OR's ability to distinguish recidivists from non-recidivists, a number of t-tests were run. This was examined for gender, disposition and race. When examining the whole sample, the average LSI-OR score of the recidivists was higher than that of the non-recidivists, t (15030) = 73.774, p <.001. The LSI-OR score of recidivists was also higher than the non-recidivists for custody, t (3733) = 28.564, p <.001, probation, t (8126) = 45.025, p <.001, and conditional sentence, t (1352) = 23.734, p <.001. Similarly, this was also true for Aboriginal offenders, t (1610) = 16.864, p <.001, Black offenders, t (1678) = 19.870, p <.001, Caucasian offenders, t (10920) = 54.845, p <.001, Other offenders, t (959.454) = 17.277, p <.001, and Unknown offenders, t (689.696) = 13.740, p<.001. The LSI-OR was able to

distinguish recidivists from non-recidivists in all groups. This is further broken down by gender in Appendix H. The t-test variables, including Cohen's d and effect size, for LSI-OR and recidivism are presented in Table 48 for disposition, and Table 49 for race.

Table 48. LSI-OR scores between non-recidivists and recidivists by disposition

	Non-Recidivists	**Recidivists**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Conditional	9.31(6.402)	16.34(7.906)	23.734	<.001	- 0.977	- 0.439
Probation	8.38(6.054)	13.55(7.340)	45.025	<.001	- 0.768	- 0.359
Custodial	18.51(8.105)	25.13(7.567)	28.564	<.001	- 0.844	- 0.389
Total	9.60(7.077)	17.72(9.184)	73.774	<.001	- 0.990	- 0.444

Table 49. LSI-OR scores between non-recidivists and recidivists by racial group

	Non-Recidivists	**Recidivists**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Aboriginal	16.49(8.605)	23.81(9.146)	16.864	<.001	- 0.824	- 0.381
Black	9.23(6.869)	16.29(8.417)	19.870	<.001	- 0.919	- 0.418
Caucasian	10.63(7.252)	18.09(8.870)	54.845	<.001	- 0.921	- 0.418
Other	7.55(5.880)	13.41(8.278)	17.277	<.001	- 0.816	- 0.378
Unknown	6.93(5.238)	11.16(7.223)	13.740	<.001	- 0.670	- 0.318

3.13.1. Summary

T-tests were used to compare the LSI-OR scores of recidivists to non-recidivists for the whole sample, for separate offender types, for separate racial groups and for separate genders; broken down by disposition. T-tests were able to distinguish recidivists from non-recidivists based on their LSI-OR scores. The recidivists scored significantly higher on the LSI-OR than the non-recidivists for the entire sample, each disposition, and each race. This was true when looking at the overall male and female sample, as well as when they were separated by disposition and gender, and when separated by race and gender.

3.14. Receiver Operating Characteristic Analysis

The number of true predictions was weighed against the number of false predictions using ROC analysis and reported using the area under the curve. For the raw LSI-OR scores, the AUC = .759 ±.006 (Figure 9). Individual disposition groups were also examined (Figures 10 to 12): conditional sentence, AUC = .758 ±.020; probation, AUC =.703 ± .009; custodial, AUC =.723 ±.015. All racial groups also displayed a positive AUC (Figures 13 to 18): Aboriginal,

AUC = .718 ±.024; Black, AUC =.746 ±.022; Caucasian, AUC =.743 ±.008; Other, AUC =.719 ±.022; Unknown, AUC =.681 ±.024. This is further separated by gender in Appendix I.

Figure 10. ROC curve for the LSI-OR prediction of recidivism for the entire sample (AUC= .759).

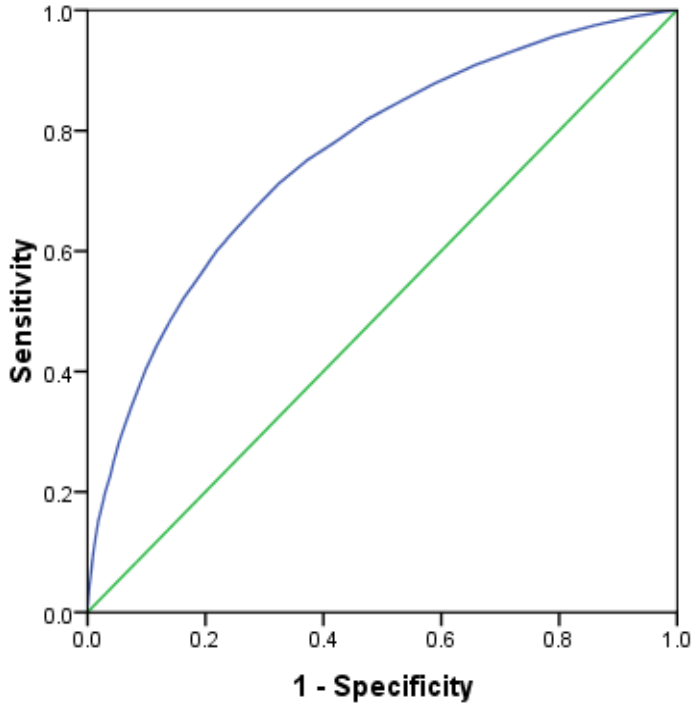


Figure 11. ROC curve for the LSI-OR prediction of recidivism for those on a conditional sentence (AUC= .758).

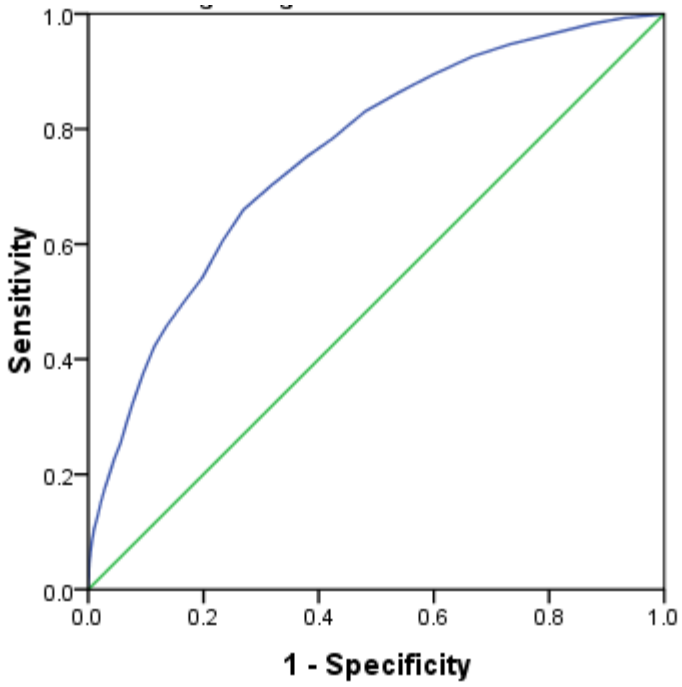


Figure 12. ROC curve for the LSI-OR prediction of recidivism for those on probation (AUC=.703).

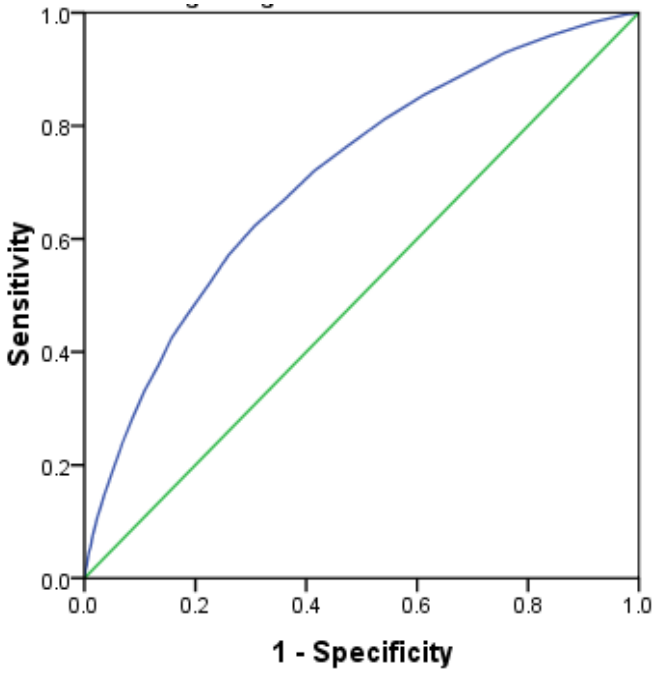


Figure 13. ROC curve for the LSI-OR prediction of recidivism for those in custody (AUC= .723)

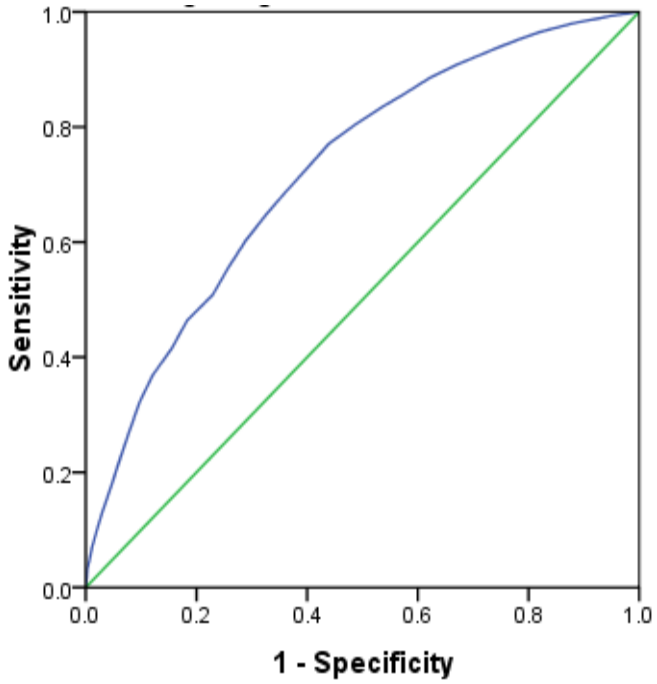


Figure 14. ROC curve for the LSI-OR prediction of recidivism for Aboriginal offenders (AUC=.718)

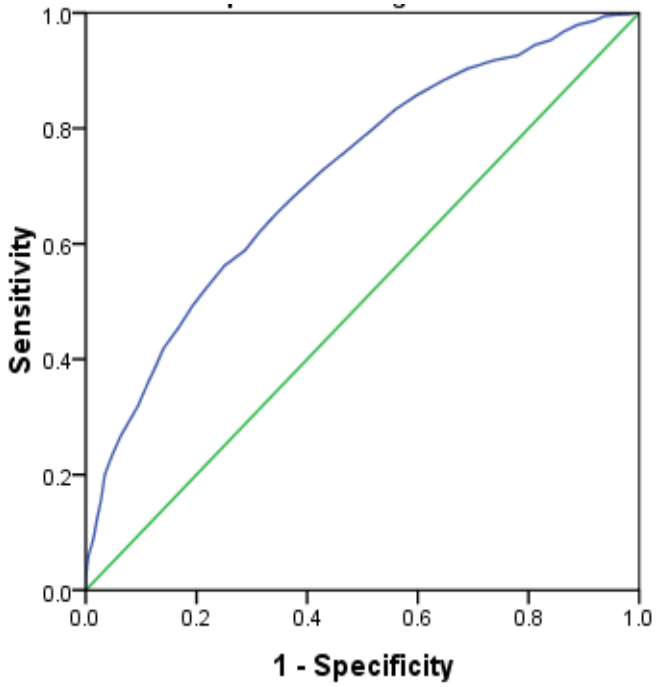


Figure 15. ROC curve for the LSI-OR prediction of recidivism for Black offenders (AUC=.746).

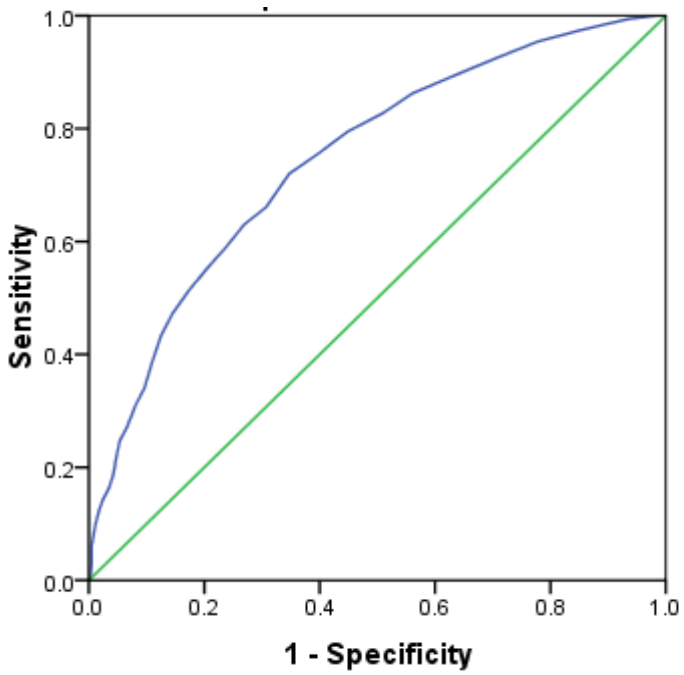


Figure 16. ROC curve for the LSI-OR prediction of recidivism for Caucasian offenders (AUC=.743).

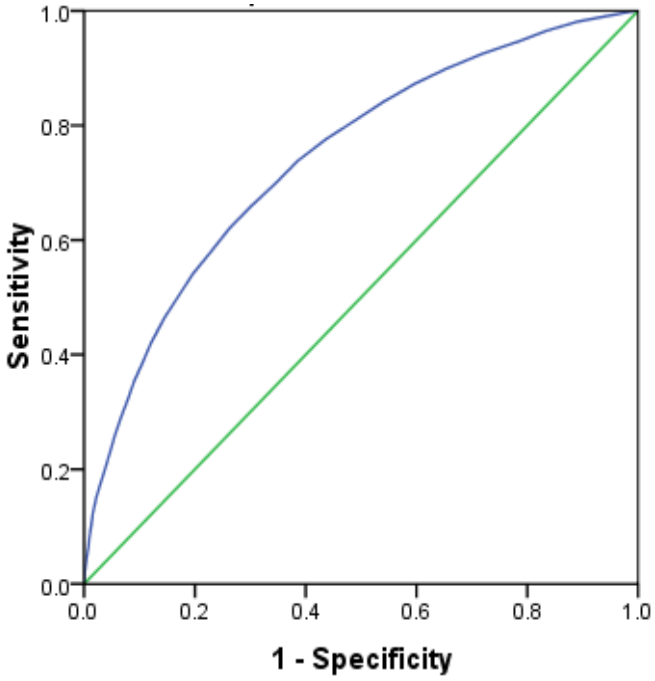


Figure 17. ROC curve for the LSI-OR prediction of recidivism for Other offenders (AUC=.719).

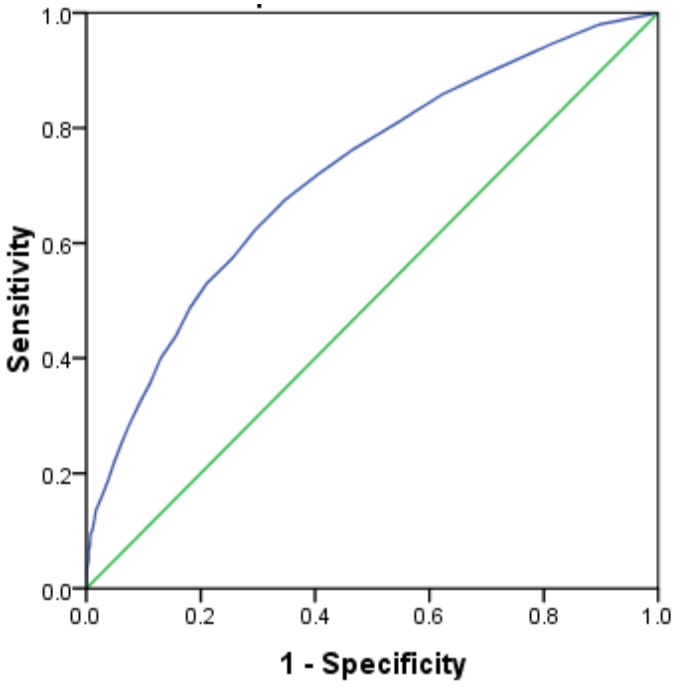
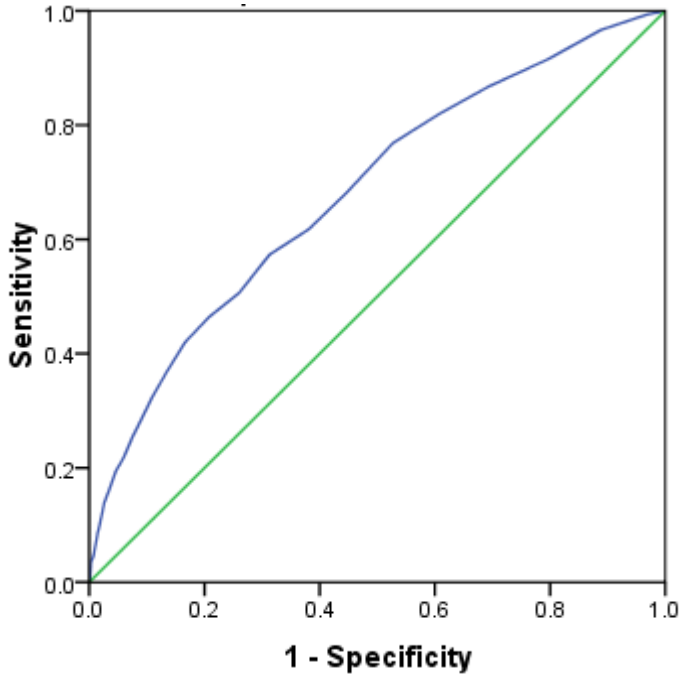


Figure 18. ROC curve for the LSI-OR prediction of recidivism for Unknown offenders (AUC=.681).



3.14.1. Summary

In this section, Receiver Operating Characteristic (ROC) analyses were conducted to examine how well the LSI-OR predicts recidivism for the whole sample, by disposition, racial group, and gender. The number of true predictions was weighed against the number of false predictions using ROC analysis and reported using the Area Under the Curve (AUC). All AUC scores were greater than .700 with the exception of Unknown race (AUC = .681). For the male sample, all AUC scores were greater than .700 with the exception of Unknown race (AUC =.680). For the female sample, all AUC scores were greater than .700 with the exception of Aboriginal female offenders (AUC = .685) and Unknown female offenders (AUC = .685). This demonstrated that the LSI-OR is an appropriate risk assessment tool in this sample for all subgroups examined.

3.15. Recidivism by LSI-OR Risk Level

3.15.1. Original and override risk levels

Pearson correlations, ROC analyses and survival analyses were conducted to determine the predictive ability of the LSI-OR risk levels. The first set of risk levels were provided by MSCSC and based on cut-offs provided in Section E of the LSI-OR scoring sheet. The original risk level forms the starting point. The override risk level is the level to which a clinician has reassigned an offender's level of risk. This clinical override was used in 16.5% (n=4363) of the cases. Changes occurred in both directions but in the majority of cases (90.40%; n=3944) the risk level was increased. The details of the change in risk level following the use of override can be found in Table 50 and Table 51 (this is broken down by gender and race in Appendix J).

Table 50. Change in number of offenders from original to override risk level

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	5351 (20.2%)	0	0	0	4083	166	948	143	11	4098 (15.5%)
2	7797 (29.5%)	0	0	10	5710	1760	294	23	0	5962 (22.5%)
3	7892 (29.8%)	0	4	81	7260	514	33	0	0	10262 (38.8%)
4	3999 (15.1%)	1	4	179	3763	52	0	0	0	4738 (17.9%)
5	1411 (5.3%)	1	115	24	1271	0	0	0	0	1390 (5.3%)
	26450 (100%)	2 (0%)	123 (.5%)	294 (1.1%)	22087 (83.5%)	2492 (9.4%)	1275 (4.8%)	166 (.6%)	11 (0%)	26450 (100%)

The current analysis shows that the LSI-OR was a better predictor of recidivism before the clinical override. This was also true when broken down by disposition, ethnicity and gender. This can be seen through the stronger positive correlations with the initial risk levels compared to the override risk levels. Similarly, the area under the curve (AUC) for the original risk levels was higher than the override risk levels. The correlations and the AUC for the original and final risk levels separated by disposition can be seen in Table 52, and by race in Table 53. Figure 19 presents the ROC curve before the override, where Figure 20 presents the ROC curve after the override. This is further broken down by gender and race in Appendix K and Appendix L.

Table 51. Reoffence rates of original and override risk levels

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	5351	609 (11.4%)	4098	480 (11.7%)
Low	7797	1676 (21.5%)	5962	1282 (21.5%)
Medium	7892	3173 (40.2%)	10262	3585 (34.9%)
High	3999	2532 (63.3%)	4738	2705 (57.1%)
Very High	1411	1166 (82.6%)	1390	1104 (79.4%)
Total	26450	9156(34.62%)	26450	9156 (34.62%)

Table 52. Pearson correlation for original and override risk levels

	Entire Sample (n=26450)	**Custodial (n=4950)**	**Conditional (n=3225)**	**Probation (n=18275)**
Correlation (r)				
Original	.423***	.376***	.393***	.322***
Override	.365***	.335***	.299***	.267***
Area Under Curve				
Original	.744 (.738 - .750)	.710 (.695 - .725)	.737 (.718 - .756)	.694 (.685 - .702)
Override	.710 (.703 - .716)	.686 (.671 - .701)	.679 (.659 - .700)	.661 (.652 - .670)

*=<.05, **=<.01, ***=<.001

Figure 19. ROC curves for LSI-OR Risk Level and Recidivism: the initial risk level before clinical override (AUC=.744).

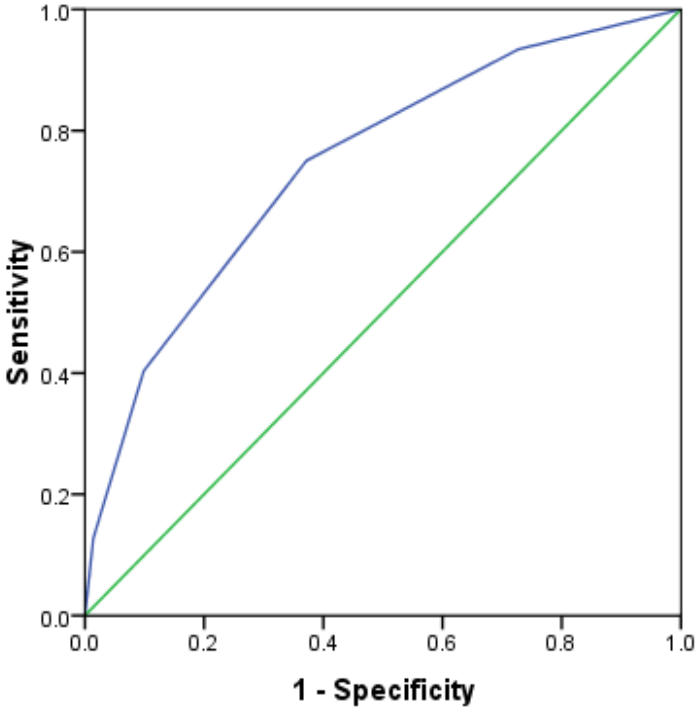


Figure 20. ROC curves for LSI-OR Risk Level and Recidivism: the final risk level after clinical override (AUC=.710)

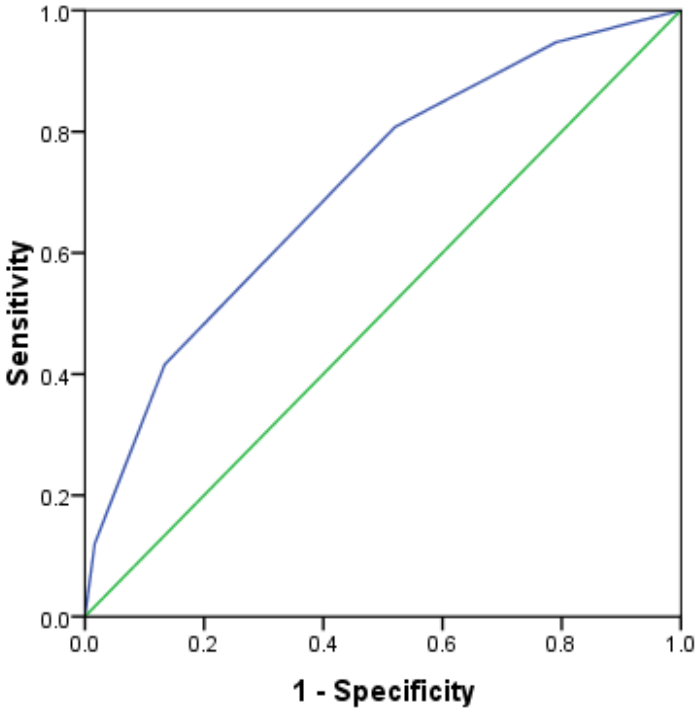


Table 53. Pearson correlation for original and override risk levels

	Aboriginal (n=1692)	Black (n=1918)	Caucasian (n=15646)	Other (n=2697)	Unknown (n=4497)
Correlation (*r*)					
Original	.355***	.411***	.401***	.339***	.235***
Override	.344***	.350***	.351***	.252***	.164***
Area Under Curve					
Original	.698(.673-.723)	.730(.708-.752)	.728(.720-.736)	.702(.679-.725)	.670(.646-.694)
Override	.691(.666-.716)	.693(.669-.716)	.698(.690-.707)	.652(.628-.675)	.628(.605-.652)

*=<.05, **=<.01, ***=<.001

3.15.2. Risk Level Cut-offs

An alternate set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into five equally proportioned categories. When examining the total sample, this created the following risk categories using the LSI-OR total scores: Very Low, 0-4; Low, 5-8, Medium, 9-

13; High, 14-20; Very High, 21-43. Table 54 displays the number of offenders per risk level and the number of re-offenders per risk level. Table 55 displays this information sorted by disposition, Table 56 displays this information sorted by gender, and Table 57 displays this information sorted by race. These rates may be compared to the recidivism rates from the original risk levels as reported in Table 51.

Table 54. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-4	5351	20.2%	609	11.4%
Low	5-8	5411	20.5%	1053	19.5%
Medium	9-13	5554	21.0%	1682	30.3%
High	14-20	5256	19.9%	2419	46.0%
Very High	21-43	4878	18.4%	3393	69.6%
Total	0-43	26450	100%	9156	34.6%

Table 55. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N**	**All N**	**Reoffenders N**
Very Low	674	47 (7.0%)	4606	549 (11.9%)	71	12 (18.3%)
Low	688	103 (15.0%)	4505	901 (20.0%)	218	49 (22.5%)
Medium	782	201 (25.7%)	4277	1306 (30.5%)	495	175 (35.4%)
High	669	280 (41.9%)	3406	1535 (45.1%)	1181	604 (51.1%)
Very High	412	257 (62.4%)	1481	896 (60.5%)	2985	2240 (75.0%)
Total	3225	888(27.53%)	18275	5187 (28.38%)	4950	3080(62.22%)

Table 56. Offenders and re-offenders by Coulson-type risk levels and gender

	Male		**Female**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	4220	514 (12.2%)	1131	95 (8.4%)
Low	4268	881 (20.6%)	1143	172 (15.0%)
Medium	4521	1428 (31.6%)	1033	254 (24.6%)
High	4349	2029 (46.7%)	907	390 (43.0%)
Very High	4258	2991 (70.2%)	620	402 (64.8%)
Total	21616	7843 (36.3%)	4834	1313 (27.2%)

Table 57. Offenders and re-offenders by Coulson-type risk levels and race

	Aboriginal		Black		Caucasian		Other		Unknown	
	All N	**Reoff. N(%)**	**All N**	**Reoff. N(%)**	**All N**	**Reoff. N(%)**	**All N**	**Reoff. N(%)**	**All N**	**Reoff. N(%)**
V.Low	72	12 (18.1%)	371	65 (17.5%)	2419	325 (13.4%)	851	99 (11.6%)	1638	107 (6.5%)
Low	117	40 (34.2%)	384	114 (29.7%)	2933	624 (21.3%)	680	129 (19.0%)	1297	146 (11.3%)
Medium	244	86 (35.2%)	404	181 (44.8%)	3415	1101 (32.2%)	547	166 (30.3%)	944	148 (15.7%)
High	430	226 (52.6%)	408	245 (60.0%)	3547	1653 (46.6%)	405	172 (42.5%)	466	123 (26.2%)
V. High	829	600 (72.4%)	351	268 (76.4%)	3332	2321 (69.7%)	214	135 (63.1%)	152	69 (45.4%)
Total	1692	965 (57.0%)	1819	873 (45.5%)	15646	6024 (38.5%)	2697	701 (26.0%)	4497	593 (13.2%)

The Coulson-type risk levels have produced strong correlations with reoffending for dispositions, gender and race that are comparable to the original risk levels. In some instances the Coulson risk levels were greater predictors of recidivism (e.g., females) where in other instance the original LSI-OR risk levels were better predictors (e.g., Aboriginals). The correlations and the AUC by disposition can be seen in Table 58, Table 59 for males by disposition, Table 60 for females by disposition, Table 61 for race, Table 62 for males by race and Table 63 for females by race. In order to further examine the Coulson levels, separate Coulson risk levels were created for each race and gender. For a breakdown of these new levels specifically constructed to examine gender and ethnicity, refer to Appendix M.

Table 58. Correlation and AUC for Original and Coulson by disposition

	Entire Sample (n=26450)	Conditional (n=3225)	Probation (n=18275)	Custodial (n=4950)
Correlation (r)				
Original	.423***	.393***	.322***	.376***
Coulson	.416***	.393***	.327***	.349***
Area Under Curve				
Original	.744 (.738 - .750)	.737 (.718 - .756)	.694 (.685 - .702)	.710 (.695 - .725)
Coulson	.747 (.741 - .753)	.746 (.728 - .765)	.701 (.692 - .709)	.683 (.667 - .699)

*=<.05, **=<.01, ***=<.001

Table 59. Pearson correlation for original and Coulson risk levels for males

	Entire Sample (n=21616)	Conditional (n=2518)	Probation (n=14443)	Custodial (n=4655)
Correlation (r)				
Original	.424***	.384***	.317***	.375***
Coulson	.415***	.384***	.320***	.347***
Area Under Curve				
Original	.743 (.736 - .749)	.731 (.709 - .752)	.689 (.680 - .698)	.710 (.695 - .725)
Coulson	.744 (.737 - .751)	.740 (.719 - .761)	.695 (.685 - .704)	.682 (.666 - .699)

*=<.05, **=<.01, ***=<.001

Table 60. Pearson correlation for original and Coulson risk levels for females

	Entire Sample (n=4834)	Conditional (n=707)	Probation (n=3832)	Custodial (n=295)
Correlation (r)				
Original	.400***	.424***	.343***	.386***
Coulson	.406***	.425***	.357***	.394***
Area Under Curve				
Original	.742 (.727 - .758)	.760 (.721 - .800)	.715 (.696 - .734)	.710 (.649 - .772)
Coulson	.752 (.737 - .768)	.770 (.731 - .809)	.727 (.708 - .745)	.689 (.623 - .755)

*=<.05, **=<.01, ***=<.001

Table 61. Pearson correlation for original and Coulson risk levels

	Aboriginal (n=1692)	Black (n=1918)	Caucasian (n=15646)	Other (n=2697)	Unknown (n=4497)
Correlation (r)					
Original	.355***	.411***	.401***	.339***	.235***
Coulson	.335***	.411***	.393***	.340***	.235***
Area Under Curve					
Original	.698 (.673 - .723)	.730 (.708 - .752)	.728 (.720 - .736)	.702 (.679 - .725)	.670 (.646 - .694)
Coulson	.684 (.658 - .710)	.734 (.711 - .756)	.730 (.722 - .738)	.709 (.686 - .731)	.674 (.650 - .698)

*=<.05, **=<.01, ***=<.001

Table 62. Pearson correlation for original and Coulson risk levels for males by race

	Aboriginal (n=1274)	Black (n=1622)	Caucasian (n=12951)	Other (n=2344)	Unknown (n=3425)
Correlation (r)					
Original	.352***	.402***	.396***	.340***	.237***
Coulson	.326***	.403***	.385***	.343***	.237***
Area Under Curve					
Original	.698 (.669 - .728)	.725 (.700 - .749)	.724 (.715 - .733)	.699 (.675 - .723)	.671 (.644 - .698)
Coulson	.677 (.647 - .708)	.728 (.703 - .752)	.724 (.715 - .733)	.707 (.683 - .731)	.677 (.649 - .704)

*=<.05, **=<.01, ***=<.001

Table 63. Pearson correlation for original and Coulson risk levels for females by race

	Aboriginal (n=418)	Black (n=296)	Caucasian (n=2695)	Other (n=353)	Unknown (n=1072)
Correlation (r)					
Original	.297***	.376***	.405***	.297***	.227***
Coulson	.303***	.383***	.415***	.302***	.227***
Area Under Curve					
Original	.663 (.611 - .715)	.716 (.651 - .781)	.738 (.718 - .758)	.719 (.644 - .795)	.669 (.618 - .719)
Coulson	.672 (.620 - .723)	.730 (.666 - .793)	.751 (.731 - .771)	.722 (.647 - .797)	.666 (.615 - .716)

*=<.05, **=<.01, ***=<.001

Re-offence rates varied according to Coulson-type risk level (χ 2(4) = 4805 p<.001). Offenders in the lowest risk level had the lowest re-offence rate while offenders in the highest risk level had the highest re-offence rate. This was also true for females, (χ 2(4) = 849.144 p<.001) and males, (χ 2(4) = 3882 p<.001).

3.15.3. Summary

The final portion of this study looked into the risk level cut-off types by using two different methods of grouping the LSI items. First, the original (and override) risk levels based on cut-offs provided in the LSI-OR scoring sheet. Second, LSI-OR risk levels were determined by dividing the sample into five equally proportioned categories, called the Coulson procedure

(Coulson et al., 1996). Pearson correlations, ROC analysis and survival analyses were conducted to determine the predictive validity of the risk levels derived from both schemes. This was examined for all gender and racial groups as it was suggested that there might be different risk assessment levels for each group based on specific needs of individual jurisdictions and populations.

Pearson correlations, ROC analysis and survival analyses were conducted to determine the predictive ability of the LSI-OR risk levels. It appears as though the best use of the LSI-OR was before the clinical override is applied, with higher correlations and AUC values for the original levels for all races. This can be seen through the tables demonstrating the reoffence rates of original and over-ride risk levels, as well as the stronger correlations between the original risk levels and recidivism for the overall sample and the subsamples.

When examining the risk level cut-offs as designed using the Coulson procedure, the original levels had stronger correlations for the overall sample and the custodial sample, and a lower correlation for those on probation. The conditional sentence sample had the same correlation for both procedures. When looking at the AUC values, the Coulson procedure was higher for all samples other than custodial, where the original was higher. The male sample followed this same pattern. For females, the Coulson outperformed the original risk levels in all instances other than the AUC for the custodial sample.

When looking at race only, there were more mixed and inconsistent results regarding whether the original risk levels, or the Coulson risk levels, were the better predictors. Finally, when creating separate Coulson levels for each gender, race and gender/race category, the results were even more inconsistent. The original risk levels were best for the Aboriginal sample. Mixed results for the Black sample - the correlation was the same, but the Coulson had a greater AUC. Similarly, for the Caucasian sample, the original risk level yielded a higher correlation, but a lower AUC. The Coulson was better for the other race sample. And finally, in the unknown sample, the correlations were identical, but the Coulson outperformed the original levels in terms of the AUC value. These results were the same when looking at the male only sample, with the exception of the Black sample, where the correlation was no higher for the Coulson procedure, and the Caucasian sample, where the AUC was not the same for both procedures. For the female sample, the Coulson procedure had higher correlations and higher ROC values for each racial

group with the exception of the Unknown group. In the unknown group, the correlations were the same, and the original levels had a slightly higher AUC value.

3.16. The Sub-Sample

A subsample was created to determine whether the results presented thus far were due to differing base rates. A sample comprised of 296 male and female offenders from each race category was randomly generated. A number of analyses were run to compare the subsample to the total sample. To view the entire analysis conducted on the subsample, please refer to Appendix N. As in the total sample, there was a significant association between the disposition of the offender and the race of the offender. There was also a significant association between the disposition of the offender and the gender of the offender. The original sample was almost a year older than the subsample (37.94 vs. 36.97). However, although there was a significant age difference between disposition groups for each sample, the same pattern existed in both samples. There was also a significant difference in age between racial groups for both samples. Although the ages followed the same pattern for the race categories, some of the differences were no longer significant in the subsample. There was no significant difference between males and females on their age at data extraction for either sample.

When looking at the offence severity scale, the mean index offence was the same for both samples. Both samples found that the type of offenders' disposition was significantly related to the offence severity. Although the mean OSS was in the same order for the disposition, there was no longer a significant difference between the conditional sentence and custody offenders in the subsample.

In looking at the internal consistency of the LSI-OR, analysis revealed strong alpha levels for the entire sample, and the subsample. In fact, in many instances the alpha levels were actually stronger for the subsample rather than the total sample. Next, in looking at the LSI-OR total scores, the mean scores were similar for both groups. There was also a significant disposition-by-race interaction for both samples, indicating that the differences in the LSI-OR scores among the three dispositions vary as a function of race.

Pearson correlations were conducted between the initial OSS and the LSI-OR total score. There were some differences between the total sample and the subsample, mainly in that correlations that were significant in the large sample were no longer significant in the subsample.

However, this is a postdictive analysis and therefore, does not have a bearing on the LSI-OR's predictive validity, thus, not of great concern.

In looking at the LSI-OR and recidivism, there was a positive correlation between the LSI-OR total score and recidivism for the subsample and the total sample, indicating that those with a higher LSI-OR score were more likely to recidivate. This was also true when broken down by disposition for both samples. An ANOVA also found that dichotomous recidivism among the three dispositions varied as a function of race, for both samples. Furthermore, when looking into correlations between LSI-OR and violent recidivism, the whole sample demonstrates a positive relationship with violent reoffence. Similarly, as expected there is a negative relationship between the "Strength" variables and violent recidivism. This same pattern exists when examining disposition and race. This was true for the whole sample, and the subsample.

There was also a significant correlation between the index offence and recidivism offence in terms of offence severity for the entire sample in both subsamples. However, when looking at the subgroups in the subsample many of these correlations were no longer significant. In the large sample, the only non-significant correlation was for females in custody, yet in the subsample, only the total sample, the custodial sample and the male sample and male custodial sample were significant. However, this is not an analysis that deals with the reliability or predictive validity of the LSI-OR, therefore, it is not a concern for the applicability of this assessment tool.

Kaplan Meier Survival Analyses were conducted with similar results for both samples. A one-way ANOVA found a significant difference in the mean survival time between disposition groups. This was true for both samples. Similarly, ROC analyses proved to produce similar results with comparable AUC values for each sample. Finally, a series of t-tests found that the LSI-OR was able to distinguish recidivists from non-recidivists in all gender, race and dispositions. This was true for the total sample and the subsample.

4.0. DISCUSSION

Risk assessment is utilized by Provincial and Federal corrections to serve a wide range of purposes for a number of different offender groups. The multitude of uses, and outcomes, for risk assessments in the criminal justice system highlights the importance of ensuring that these tools are both reliable and valid. In the province of Ontario, the LSI-OR is the risk assessment tool that is currently being administered throughout in the community through probation and in provincial institutions. However, despite this widespread use, the LSI-OR was developed on a sample of primarily Caucasian male offenders, therefore, its utility in predicting reoffence is unknown for females and non-Caucasian offenders.

The current study was designed to assess the LSI-OR's utility at predicting recidivism among male and female Aboriginal, Caucasian, and Black offenders released from custody and being supervised in the community. Specifically, this study examined the predictive validity of the LSI-OR using a provincial sample composed of both male and female offenders. The reliability and validity of the LSI-OR was assessed by examining the internal consistency of the LSI-OR and its ability to predict recidivism, discriminating recidivists from non-recidivists across gender, ethnicity and sentence type. The LSI-OR was then analyzed as a whole and separately considering the individual subscales.

4.1. Hypotheses

4.1.1. Hypothesis One

It was hypothesized that LSI-OR scores would be positively correlated with recidivism for males and females. This study examined multiple definitions of recidivism. First, to determine what events were to be considered as recidivism, three measures were examined; recidivism with technical offences, recidivism without technical offences, and violent recidivism only. Second, once recidivism was defined, three measures of recidivism were examined: dichotomous recidivism; the offence severity scale; and finally, the amount of time to recidivate. These measures were all used in the various analyses designed to examine the reliability and validity of the LSI-OR in predicting recidivism in various samples of gender, race and disposition.

There was a positive correlation between LSI-OR scores and recidivism. This was true for all measures of recidivism, with technical offences (r=.441), total criminal code offences/no

technical offences (r=.436), violent offences only (r=.284). This was also true when broken down by disposition, race, and gender. This positive relationship suggests that as LSI-OR scores increase, so does the likelihood of committing a reoffence.

A major concern regarding risk assessment instruments is the generalizability of predictions across samples (Olver et al., 2009). In the present study, this was the process of determining whether the LSI-OR could predict recidivism in male and female offenders of Aboriginal, Black and Caucasian ethnicity, among all disposition groups. The LSI-OR continued to significantly predict recidivism and to do so at comparable degrees of magnitude across all gender, ethnicity and sentence type subgroups. With correlations ranging from r =.340 (probation sample) to .441 (total sample) for general recidivism, and r=.174 (probation and Aboriginal samples) to r=.302 (Caucasian sample) for violent recidivism.

The magnitude for prediction was comparable to predictions in other adult and youth studies. A meta-analysis by Andrews et al. (2006) reported a grand mean predictive estimated (*r)* for general recidivism .36, and violent recidivism .25, when using the LSI-R (Rettinger & Andrews, 2010). Similarly Smith et al. (2009) reported r=.35 for female offenders, much lower than then .426 found in the current study. Rettinger and Andrews (2010) however, found very high correlations between the LS/CMI and general recidivism (r=.63), and violent recidivism (r=.45) in their female sample with subgroups correlating from .45 to .71. Andrews et al., (2006) reported the mean predictive validity estimate from studies using the general risk/need section of the LS/CMI to be .41 (Rettinger & Andrews, 2010). Similarly, Rettinger and Andrews (2010) reported that additional studies found "very adequate" mean predictive validity estimated for the LSI-R with women, supporting the notion that the GPCSL approach is applicable to women.

Previous examinations of the LSI and its derivatives have demonstrated reliability and predictive validity across many field settings and offender populations. Smith, Cullen and Latessa (2009) reviewed 27 reports on the predictive validity of LSI-R with female offenders. Andrews et al. (2011) examined some of the more recent meta-analyses on the LSI family of risk and need instruments and found that the weighted mean validity of LSI risk and need instruments with female offenders (r=.345) is at least as great as the mean validity found with male offenders (r=.322). They argued that in the event that solid evidence of gender differences in the validity of LSI family of risk assessment emerged, it would be strong with respect to female offenders. In fact, Andrews et al., (2011) argue that the gender neutrality of the LSI

family of risk and need instruments appears to be well established despite the criticisms and objections of some proponents of gender specificity.

However, the current analysis found higher correlations on general recidivism for males (r=.439) than females (r=.426) when looking at the total LSI-OR. This difference, however, was not statistically significant. However, when examining all of the LSI-OR subcomponents using Fisher's z test, there were significant differences on nine of the subscales. Although significant for both males and females, criminal history, education/employment, leisure/recreation, companions, procriminal attitudes, antisocial patterns, perpetration history and institutional factors were all significantly better predictors of general recidivism in males than females. Substance abuse was a significantly better predictor for females than males.

In terms of internal consistency, the findings in this study were similar to those reported by Folsom and Atkinson (2007). They examined self-report versions of the LSI-R and the Childhood and Adolescent Taxon Scale (CAT) and found them both to be successfully able to predict recidivism in a sample of 100 female offenders serving a sentence of two years or more. However, the CAT was only able to significantly predicit violent recidivism, where the LSI-R predicted both violent and nonviolent recidivism. Similar to the present study, they found that although there was good overall internal consistency, there was considerable variability in the subscales with the alpha coefficient ranging from -.07 for Leisure/Recreation to .91 for Companions. The current analysis also found the Leisure/Recreation alpha to be negative for some subgroups. Folsom and Atkinson (2007) speculate that the low alphas could be due to the small scale size of two items. This could cause vulnerability to overall inconsistency. They explained that in their study, the majority of women responded positively to the question on having rewarding hobbies and sports, but negatively to the question regarding belonging to organized activities and clubs.

Hastings, Krishnan, Tangney and Stuewig (2011) examined the predictive and incremental validity of the VRAG in a sample of males and females. They found a significant gender difference in terms of both VRAG item and total score means. Also, there were significant gender differences in terms of correlations between the VRAG and concurrent measures of aggression. Specifically, the VRAG scores significantly predicted institutional misconduct during incarceration and recidivism in the first year post-release for males only. Also, the VRAG scores predicted institutional misconduct and recidivism beyond psychopathy

for males only. In light of these findings, Hastings et al. (2011) argue against the use of the VRAG for assessing violence risk among females. They noted that although some risk factors are gender neutral, clinicians cannot assume that all risk factors shown to predict violence in males, will also predict violence in females. As such, they recommended that alternative measures be used, preferably those based on structured professional judgement such as the HRC-20 and the LSI-R. In addition, Hastings et al. (2011) suggested that future research should attempt to identify female-specific valid indicators of risk for violence that can augment or supplement the predictive utility of psychopathy.

Further, Andrews et al. (2011) examined the issues of gender-neutral and gender-specific risk factors in the LS family of risk assessment instruments. They found that although gender specificity exists, it is scattered and minimal to mild in magnitude. Van Voorhis et al. (2008) found that although both gender-neutral and gender-responsive risk factors were shown to predict recidivism, the individual predictive ability varied across samples and settings (as cited in Rettinger & Andrews, 2010). Thus, they argued more research was required. Following up on the Van Voorhis et al. (2008) study, Rettinger and Andrews (2010) examined the LS/CMI and concluded that this tool performed well in the prediction of general and violent recidivism of more than 400 female offenders. In addition, they found that none of the gender-specific factors had incremental validity over the gender-neutral risk and need variables.

Returning to a discussion of the current findings, the magnitude of the correlations between the LSI-OR subcomponents and recidivism was compared across various subgroups, specifically, the three main races (Aboriginal, Black and Caucasian), between the two genders, and within the individual race/gender groups. There were a few significant differences, demonstrating differences in predictive validity between the subgroups examined.

Looking at Appendix F, we can see that the "barrier to release" subscale significantly predicted recidivism in both Aboriginal and Caucasian offenders better than Black offenders. When separating for gender, these differences were still significant in the male sample, but not the female sample. As such, in a future study, one may examine the predictive validity of the LSI-OR by giving this subscale less weight in the overall score for Black male offenders, compared to non-Black offenders. There are some other significant differences between the subscale correlations and recidivism on gender and race subgroups, these are presented in Appendix F. A further study might look into these differences in greater depth and develop

different weightings for the items that may play a stronger (or weaker) role in the prediction of recidivism for certain subgroups. By doing this, the LSI-OR may be able to better predict recidivism by giving more weight to the stronger predictors of different subgroups.

4.1.2. Hypothesis Two

It was hypothesized that the LSI-OR risk levels, based on existing cut-off levels, would predict recidivism better than risk levels based on the Coulson method. The LSI-OR risk levels (original and override) were based on cut-offs provided in the LSI-OR scoring sheet, and the Coulson procedure risk levels were determined by dividing the sample into five equally proportioned categories, called the Coulson procedure.

Pearson correlations, ROC analysis and survival analyses were conducted to determine the predictive ability of the LSI-OR risk levels. It appears as though the best use of the LSI-OR is before the clinical override is applied, with higher correlations and AUC values for the original levels (r=.423, AUC=.744; override r=.365, AUC=.710). This was true when separated for disposition, race, and gender. In examining the CIs of the AUC values, they did not overlap for the entire sample as well as the conditional, probation, Caucasian and male samples.

When examining the risk level cut-offs as designed using the Coulson procedure, the original levels had stronger correlations for the overall sample and the custodial sample, and a lower correlation for those on probation. The conditional sentence sample had the same correlation for both procedures. When looking at the AUC values, the Coulson procedure was higher for all samples other than custodial, where the original was higher. The male sample followed this same pattern. The Coulson outperformed the original risk levels for females and Black. The original outperformed the Coulson for Aboriginal, and there were mixed results for Caucasian. In examining the CIs of the AUC values, they all overlapped, indicating that the differences were not actually significant.

A study by Brews (2009) on an earlier sample of Ontario provincial offenders also examined theses risk levels, specific to female offenders and found comparable correlations and AUC values for initial risk level (r=.439, AUC=.771) and override risk level (r=.412, AUC=.755). Similar to the current analysis, Brews (2009) found the initial risk levels to consistently outperform the override levels in all subgroups analyzed (probation/conditional sentence/custody).

In Appendix M, a set of Coulson risk levels were developed using the female offenders. The five risk categories were created by dividing the female sample into give equally proportioned categories. This resulted in the following risk categories: Very Low, 0-3; Low, 4-7; Medium, 8-11; High, 12-17; Very High, 18-43. These risk levels were quite different from the risk levels arrived at by Brews (2009) when he employed the Coulson procedure on his sample of female offenders (Very Low, 0-5; Low, 6-10; Medium, 11-16; High, 17-23; Very High, 24-42). However, both the Coulson levels produced were mixed with the results from Brews (2009) when making comparisons to entire female sample, by disposition, and by race. The statistics from the female Coulson and the Brews Coulson are presented in Appendix N.

Interestingly, the overall female sample is one of the only groups that consistently produced higher correlations and AUC values for the Coulson risk levels over the original risk levels (with the exception of the AUC value for the Custodial sample and the females of Unknown race). Brews also found that the Coulson levels outperformed the original risk levels, except when separating for gender. However, it is important once again note that the higher Coulson values were not significant in the present study.

This study has found the LSI-OR to be both reliable and valid as a risk assessment tool. There is also evidence to support the use of the LSI-OR for risk assessment in Aboriginal, Black, and Caucasian male and female provincial offenders in Ontario. However, when it comes to what method should be used for creating risk assessment cut-off levels, there were mixed and inconsistent results. Thus, at the present time, it is suggested that the LSI-OR risk level as designed in the LSI-OR manual continue to be used when performing risk assessments. It is also suggested that the clinical override be use cautiously since the original risk levels consistently outperformed the override risk levels. Thus, overrides in the LSI-OR risk assessments must be performed sparingly.

Although it appears as though certain subgroups might benefit from different cut-offs than what is suggested by the developers of the LSI-OR, the Coulson procedure has not produced those levels. Instead, future studies may want to expand on this study by examining different methods for scoring the LSI-OR (or other risk assessment tools) to increase reliability and predictive validity among the many subgroups available. Similar to the conclusions reaches by Lowenkamp and Latessa (2002), it is suggested that the inconsistency in the findings of predictive validity could be due to potential needs differences regarding cut-off scores. As such,

it may be beneficial for program sites to develop specific cut-off scores based on their own populations.

4.2. Conclusion

Risk assessment is an important and interesting topic, however, it has been argued (Olver et al., 2009) that the ultimate goals of risk assessment should be focused around the prevention of further recidivism, rather than its prediction. With this in mind, Olver et al., (2009) argued that some of the most productive methods for prevention are through treatment, effective case management, and supervision. As such, risk assessments that include a case management component, like the LSI-OR and LS/CMI can aid clinicians in offender management that may ultimately reduce recidivism when appropriately matched to offender risk, need and responsivity factors.

As mentioned previously, some critics claim that applying risk assessment tools to females that were developed on samples comprised primarily on males is ill advised. Rettinger and Andrews (2010) explained that there are some who argue that risk factors derived from generic theories of crime are acceptable for guiding treatment planning and correctional supervision decisions in females, while others argue that this approach is flawed because it fails to consider gender differences. Although these differences indicate that some subsections of the LSI-OR appear to be better predictors of recidivism in certain groups, this does not indicate that this LSI-OR is more acceptable for some races or genders than others. In fact, when looking at the logistic regression analyses, we can see that although ethnicity has a significant influence on recidivism, the variability accounted for by the race variable is relatively small in comparison to the predictive ability of the LSI-OR. Therefore, the differences in predictive validity of the subscales on different racial and gender groups may in fact offer opportunities for differently assessing risk in certain subsamples of the population.

Risk assessment instruments are never going to be entirely accurate in predicting the risk to reoffend in all offenders. Studies on risk assessment instruments consistently show that a small percentage of the lowest risk offenders do reoffend. Similarly, it is also seen that some of those placed in the high risk category do not reoffend. There are many potential explanations for these findings. With the inclusion of dynamic items in the risk assessment tools, we are able to understand that offender circumstances relating to risk can change over time. For example, an offender who is deemed high risk upon release from custody may find himself a steady job. Not

only would the employment improve his financial situation, it may also allow him to meet new people and develop relationships with prosocial peers, while spending less time with criminal associates. In developing these new friendships, he may become involved in some leisure time activities or begin a relationship with someone new. All of these factors could contribute to his ability to desist.

On the other hand, someone might be deemed low risk to reoffend when they begin their conditional sentence; however, being convicted of a crime may have lead to a marital breakdown of a previously stable relationship. This could potentially allow for a great deal more free time, which may now be spent with antisocial peers, thus, improving his likelihood of committing a new crime. With this is mind, we can never expect a risk assessment tool to be accurate one hundred percent of the time. This also speaks to the importance of the multiple roles that risk assessment can play. It is not simply to assess a client for their risk of reoffence, but to also assess potential strengths and weakness in order to best manage these dynamic risk factors.

In this study, the original risk assessment levels consistently outperformed the final risk levels after the clinical override was applied. Not only was this difference significant for many of the subsamples, but similar findings were also reported by Brews (2009). This is a particularly important finding since it is these final risk assessment levels that are actually used to inform decisions. Although out of the scope of the current analysis, a future study could examine the idea of using LSI-OR total scores to inform decisions, rather than looking at the risk level cut-offs. In comparing the LSI-OR risk levels and the Coulson risk levels, there were mixed and inconsistent results. Similarly, when looking at the Brews (2009) study in comparison to the current analysis of cut off levels for female offenders, there were also mixed findings on what method of grouping scores offered superior prediction. Therefore, it might be beneficial to abandon the idea of cut-off scores all together. Instead, assessors could be provided with base rates for each cut-off score, as well as appropriate treatment, management and responsivity considerations. In addition, this would avoid the potentially damaging results of categorizing an offender to a specific risk level.

Examining LSI-OR total scores could also eliminate the large differences in risk between offenders scoring low in the risk category from those scoring high in the risk category. For example, an offender who is classified in the high-risk offending category with the lowest possible score, would actually have a risk more similar to an offender who is classified in the

medium risk category with the highest possible score than another offender who is also classified as high, but has the highest score possible for designation in the high risk category. Further pointing to the potential superiority of using LSI-OR raw scores, rather than risk levels.

In terms of gender and ethnicity, it is not expected that this study will end the debate on the applicability of risk assessment instruments to female and ethnic minorities. However, these results do support the idea that risk assessments can be part of effective clinical service provision when they are administered in a conscientious, ethical, appropriate and standardized manner (Olver et al., 2009). In fact, Olver et al., (2009) argued that the appropriate use of these measures may actually minimize intrusiveness of the justice system, identify targets for service delivery, and inform sentencing options. Although their meta-analysis focused on youth offenders, these same conclusions can be drawn for the applicability and utility of risk assessment instruments on other potentially vulnerable populations, such as women and ethnic minorities.

Although these findings are promising for the utility of risk assessment on vulnerable populations, other authors disagree. In Martel, Brassard and Jaccoud's (2011) commentary on risk management in Canadian corrections, they claimed that the application of risk assessment on Aboriginal offenders is flawed. In fact, they argued that risk markers are "ill-adapted" to the historical, socio-economical and cultural specificities of Aboriginal people and that these risk factors are based on choices that disadvantage Aboriginal offenders. Furthermore, they argued that the categorization of Aboriginal offenders as criminogenic is an example of structured racialization since the tools themselves generate systemic policies and practice towards Aboriginal offenders.

The current analysis examined the reliability and predictive validity of the LSI-OR, however, it is important to note that many other risk assessment instruments are available to correctional practitioners. The LSI-OR has demonstrated reliability and predictive validity in this sample of provincial offenders, however, this does not indicate that the LSI-OR is superior to other risk assessment instruments. Similarly, these results cannot be generalized to all risk assessment instruments or to all offender populations. Meta-analysis offers the best means of comparing these results to the findings of other instruments and other studies. Yang et al. (2010) concluded that clinicians and researchers now have a number of well-constructed and well-validated tools available to them. Therefore, deciding on the appropriate tools, or which tools can provide the most accurate predictions remains an important theoretical and practical question.

Yang et al. (2010) reported that some recent attempts to answer this question through meta-analytic reviews of the literature have produced inconsistent results. They attribute this partly to methodological issues. In an attempt to examine which tool can best predict violence, Yang et al. (2010) examined the predictive efficacy of nine commonly used risk assessment tools, using multilevel regression models. They found that all risk assessment tools predicted violence at above-chance levels, with medium effect sizes. No tool predicted violence significant better than the others. Thus, they concluded that there was no appreciable or clinically significant difference in the violence-predictive efficacies of the nine tools examined, and therefore, id the prediction of violence was the only criterion for the selection of a risk assessment tool, then these nine tools were interchangeable. Therefore, Yang et al. (2010) recommended that the choice of which tool to use should be based on what additional relevant clinical, criminal justice, or management functions the tool can perform, rather than the tools predictive power in comparison to other tools. For example, tools with dynamic risk factors can assess change in risk, where static risk factors cannot. Therefore, if the ultimate goal of a risk assessment instrument is to inform treatment and track change, then a third generation tool should be chosen over a second generation tool.

4.2.1. Limitations and Future Directions

As in any archival study, there are certain limitations that must be considered. Since this data was extracted from an existing database, there was no control over the variables available for the analysis. Similarly, there are limitations in the way recidivism was defined. By using the MCSCS offender database, some recontacts may have gone undetected, such as charges from other provinces. A more extensive definition of recidivism using the Canadian Police Information Center (CPIC) may have been more comprehensive, matching offenders to any criminal records within the CPIC databank. Finally, the integrity of the data depends on a number of individuals who would have entered data into the existing database.

The LSI-OR has shown acceptable predictive validity and reliability in this sample of provincial offenders. Analyses has shown that the LSI-OR was successful in distinguishing recidivists from non-recidivists for all racial, gender and disposition groups. This study has added great depth to the LSI risk assessment literature by focusing on the less studied female and minority groups, while allowing for comparisons between groups and with the overall offender population. In particular, a major strength of this study was the ability to examine a relatively

complete cohort of offenders from across a large jurisdiction (province on Ontario) over a one year period. Also, the analysis of different cut off points has contributed to the literature as different cut off levels may be more appropriate for certain groups in the population. This research has built on the Aboriginal LSI-OR study by Tanasichuk and Wormith (2009), as well as the female LSI-OR study by Brews (2009). This study has expanded on these previous studies by addressing the issues of ethnicity and gender in a more complete fashion than these studies that looked at women and Aboriginal offenders alone.

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Appendix A

Table A 1. Number and percentage of offenders by disposition and racial group for males

	Custodial	Conditional	Probation	Total
Caucasian	**3140** 67.4%*	**1415** 56.2%*	**8396** 58.1%*	**12951** 60.2%*
(Row %)	24.2%	10.9%	64.8%	100%
Aboriginal	**559** 12.0%*	**132** 5.2%*	**583** 4.0%*	**1274** 5.9%*
(Row %)	43.9%	10.4%	45.8%	100%
Black	**434** 9.3%*	**209** 8.3%*	**979** 6.8%*	**1622** 7.5%*
(Row %)	26.8%	12.9%	60.4%	100%
Other	**321** 6.9%*	**339** 13.5%*	**1684** 11.7%*	**2344** 10.9%*
(Row %)	13.7%	14.5%	71.8%	100%
Unknown	**201** 4.3%*	**423** 16.8%*	**2801** 19.4%*	**3425** 15.9%*
(Row %)	5.9%	12.4%	81.8%	100%
Total	**4655** 100%*	**2518** 100%*	**14443** 100%*	**21516** 100%*
(Row %)	21.5%	11.6%	66.8%	100%

*Column percentages

Table A 2. Number and percentage of offenders by disposition and racial group for females

	Custodial	Conditional	Probation	Total
Caucasian	**201** 68.1%*	**381** 53.9%*	**2113** 55.1%*	**2695** 55.8%*
(Row %)	7.5%	14.1%	78.4%	100%
Aboriginal	**44** 14.9%*	**66** 9.3%*	**308** 8.0%*	**418** 8.6%*
(Row %)	10.5%	15.8%	73.7%	100%
Black	**16** 5.4%*	**52** 7.4%*	**228** 5.9%*	**296** 6.1%*
(Row %)	5.4%	17.6%	77.0%	100%
Other	**14** 4.7%*	**65** 9.2%*	**274** 7.2%*	**353** 7.3%*
(Row %)	4.0%	18.4%	77.6%	100%
Unknown	**20** 6.8%*	**143** 20.2%*	**909** 23.7%*	**1072** 22.2%*
(Row %)	1.9%	13.3%	84.8%	100%
Total	**295** 100%*	**707** 100%*	**3832** 100%*	**4834** 100%*
(Row %)	6.1%	14.6%	79.3%	100%

*Column percentages

Appendix B

Table B 1. Index offence severity frequencies and percentages, separated by disposition for males

Offence Severity	**Offence Type**	**Conditional**		**Probation**		**Custodial**		**Total**	
		N	%*	N	%*	N	%*	N	%*
1	Unknown	0	0	4	0	4	.1	8	0
2	Municipal Bylaw Offences	2	.1	58	.4	41	.9	101	.5
3	Other Provincial Offences	0	0	2	0	1	0	3	0
4	Liquor Licence Act Offences	0	0	108	.7	75	1.6	183	.8
5	Highway Traffic Act Offences	0	0	0	0	0	0	0	0
6	Parole Violations	42	1.7	84	.6	24	.5	150	.7
7	Other Federal Statute Offences	3	.1	257	1.8	1	0	261	1.2
8	Misc. Offences against Public Order	54	2.1	467	3.2	169	3.6	690	3.2
9	Drinking & Driving Offences	51	2.0	680	4.7	271	5.8	1002	4.6
10	Breach of Court Order / Escape	69	2.7	116	.8	187	4.0	372	1.7
11	Criminal Code Traffic Offences	75	3.0	504	3.5	37	.8	616	2.8
12	Drug Possession Offences	11	.4	209	1.4	38	.8	258	1.2
13	Obstruction of Justice Offences	8	.3	34	.2	7	.2	49	.2
14	Morals & Gaming Offences	23	.9	856	5.9	37	.8	916	4.2
15	Arson/Property Damage Offences	426	16.9	5379	37.2	686	14.7	6491	30
16	Assault & Related Offences	232	9.2	1891	13.1	639	13.7	2762	12.8
17	Theft/Possession Offences	111	4.4	1492	10.3	316	6.8	1919	8.9
18	Misc. Offences against the Person	286	11.4	687	4.8	219	4.7	1192	5.5
19	Fraud & Related Offences	69	2.7	514	3.6	186	4.0	769	3.6
20	Weapons Offences	554	22.0	166	1.1	439	9.4	1159	5.4
21	Traffic/Import Drug Offences	96	3.8	131	.9	79	1.7	306	1.4
22	Non-Violent Sexual Offences	157	6.2	578	4.0	691	14.8	1426	6.6
23	Break & Enter & Related Offences	142	5.6	135	.9	160	3.4	437	2.0
24	Violent Sexual Offences	82	3.3	91	.6	324	7.0	497	2.3
25	Serious Violent Offences	25	1.0	0	0	24	.5	49	.2
26	Homicide & Related Offences	0	0	0	0	0	100%	0	0
	Totals	**2518**	**100%**	**14443**	**100%**	**4655**	**100%**	**21616**	**100%**

Table B 2. Index offence severity frequencies and percentages, separated by disposition for females

Offence Severity	Offence Type	Conditional		Probation		Custodial		Total	
		N	%*	N	%*	N	%*	N	%*
1	Unknown	0	0	1	0	0	0	1	.0
2	Municipal Bylaw Offences	0	0	23	.6	0	0	23	.5
3	Other Provincial Offences	0	0	0	0	0	0	0	0
4	Liquor Licence Act Offences	0	0	19	.5	1	.3	20	.4
5	Highway Traffic Act Offences	0	0	0	0	0	0	0	0
6	Parole Violations	6	.8	40	1.0	2	.7	48	1.0
7	Other Federal Statute Offences	5	.7	76	2.0	2	.7	83	1.7
8	Misc. Offences against Public Order	12	1.7	138	3.6	5	1.7	155	3.2
9	Drinking & Driving Offences	12	1.7	166	4.3	11	3.7	189	3.9
10	Breach of Court Order / Escape	15	2.1	38	1.0	8	2.7	61	1.3
11	Criminal Code Traffic Offences	19	2.7	90	2.3	4	1.4	113	2.3
12	Drug Possession Offences	9	1.3	66	1.7	4	1.4	79	1.6
13	Obstruction of Justice Offences	3	.4	51	1.3	2	.7	56	1.2
14	Morals & Gaming Offences	4	.6	120	3.1	2	.7	126	2.6
15	Arson/Property Damage Offences	93	13.2	1207	31.5	51	17.3	1351	27.9
16	Assault & Related Offences	137	19.4	984	25.7	69	23.4	1190	24.6
17	Theft/Possession Offences	8	1.1	156	4.1	11	3.7	175	3.6
18	Misc. Offences against the Person	233	33.0	516	13.5	43	14.6	792	16.4
19	Fraud & Related Offences	7	1.0	31	.8	4	1.4	42	.9
20	Weapons Offences	111	15.7	38	1.0	40	13.6	189	3.9
21	Traffic/Import Drug Offences	1	.1	9	.2	3	1.0	13	.3
22	Non-Violent Sexual Offences	16	2.3	57	1.5	14	4.7	87	1.8
23	Break & Enter & Related Offences	2	.3	1	0	0	0	3	.1
24	Violent Sexual Offences	11	1.6	4	.1	17	5.8	32	.7
25	Serious violent Offences	3	.4	1	0	2	.7	6	.1
26	Homicide & Related Offences	0	0	0	0	0	0	0	0
	Totals	**707**	**100%**	**3832**	**100%**	**295**	**100%**	**4834**	**100%**

Appendix C

Table C 1. Alpha scores for total LSI-OR and subcomponents by disposition group for males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.898	.891	.877	.921
Overall (40)	.884	.883	.866	.913
Criminal History (8)	.745	.833	.814	.870
Education / Employment (9)	.805	.806	.812	.834
Family / Marital (4)	.368	.415	.333	.382
Leisure / Recreation (2)	.329	.387	.362	.434
Companions (4)	.572	.592	.595	.628
Procriminal Attitudes (4)	.530	.562	.553	.603
Substance Abuse (8)	.810	.825	.809	.833
Antisocial Pattern (4)	.467	.316	.360	.521

Table C 2. Alpha scores for total LSI-OR and subcomponents by disposition group for females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.903	.898	.886	.907
Overall (40)	.891	.891	.876	.899
Criminal History (8)	.750	.834	.798	.840
Education / Employment (9)	.786	.834	.842	.844
Family / Marital (4)	.408	.431	.381	.397
Leisure / Recreation (2)	.426	.416	.352	.387
Companions (4)	.628	.637	.606	.633
Procriminal Attitudes (4)	.500	.597	.537	.577
Substance Abuse (8)	.833	.870	.835	.854
Antisocial Pattern (4)	.467	.416	.358	.439

Table C 3. Alpha scores for total LSI-OR and subcomponents by disposition group for Aboriginal males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.887	.893	.882	.924
Overall (40)	.870	.880	.867	.914
Criminal History (8)	.645	.804	.803	.847
Education / Employment (9)	.763	.800	.807	.823
Family / Marital (4)	.414	.472	.316	.420
Leisure / Recreation (2)	.224	.396	.324	.443
Companions (4)	.592	.542	.640	.637
Procriminal Attitudes (4)	.614	.620	.616	.691
Substance Abuse (8)	.741	.789	.776	.795
Antisocial Pattern (4)	.556	.365	.444	.608

Table C 4. Alpha scores for total LSI-OR and subcomponents by disposition group for Aboriginal females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.882	.892	.887	.913
Overall (40)	.861	.878	.876	.903
Criminal History (8)	.734	.829	.780	.833
Education / Employment (9)	.535	.847	.831	.841
Family / Marital (4)	.513	.361	.418	.432
Leisure / Recreation (2)	-.158	.566	.254	.383
Companions (4)	.641	.594	.602	.629
Procriminal Attitudes (4)	.612	.417	.578	.613
Substance Abuse (8)	.664	.803	.812	.821
Antisocial Pattern (4)	.582	.592	.336	.511

Table C 5. Alpha scores for total LSI-OR and subcomponents by disposition group for Black males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.883	.891	.880	.913
Overall (40)	.867	.880	.867	.903
Criminal History (8)	.752	.828	.815	.860
Education / Employment (9)	.793	.831	.824	.835
Family / Marital (4)	.372	.323	.234	.308
Leisure / Recreation (2)	.396	.343	.424	.461
Companions (4)	.509	.639	.606	.624
Procriminal Attitudes (4)	.441	.618	.585	.595
Substance Abuse (8)	.821	.833	.803	.825
Antisocial Pattern (4)	.484	.343	.384	.494

Table C 6. Alpha scores for total LSI-OR and subcomponents by disposition group for Black females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.820	.869	.874	.894
Overall (40)	.792	.857	.862	.884
Criminal History (8)	.832	.828	.754	.831
Education / Employment (9)	.491	.837	.865	.856
Family / Marital (4)	.358	.483	.422	.440
Leisure / Recreation (2)	-.168	.494	.309	.322
Companions (4)	.368	.700	.571	.604
Procriminal Attitudes (4)	.312	.631	.615	.613
Substance Abuse (8)	.883	.850	.846	.865
Antisocial Pattern (4)	.280	.214	.236	.281

Table C 7. Alpha scores for total LSI-OR and subcomponents by disposition group for Caucasian males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.886	.881	.872	.916
Overall (40)	.869	.871	.860	.906
Criminal History (8)	.706	.822	.810	.861
Education / Employment (9)	.797	.794	.804	.826
Family / Marital (4)	.340	.375	.330	.362
Leisure / Recreation (2)	.327	.390	.372	.439
Companions (4)	.566	.596	.586	.622
Procriminal Attitudes (4)	.518	.572	.558	.597
Substance Abuse (8)	.780	.805	.797	.816
Antisocial Pattern (4)	.500	.310	.371	.515

Table C 8. Alpha scores for total LSI-OR and subcomponents by disposition group for Caucasian females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.897	.895	.884	.904
Overall (40)	.884	.887	.873	.895
Criminal History (8)	.746	.833	.808	.842
Education / Employment (9)	.781	.826	.832	.834
Family / Marital (4)	.356	.420	.350	.366
Leisure / Recreation (2)	.480	.409	.379	.409
Companions (4)	.632	.659	.612	.642
Procriminal Attitudes (4)	.507	.625	.526	.574
Substance Abuse (8)	.819	.867	.822	.843
Antisocial Pattern (4)	.432	.416	.383	.450

Table C 9. Alpha scores for total LSI-OR and subcomponents by disposition group for Other males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.899	.847	.855	.894
Overall (40)	.887	.835	.843	.884
Criminal History (8)	.796	.805	.791	.839
Education / Employment (9)	.802	.789	.818	.826
Family / Marital (4)	.285	.443	.341	.359
Leisure / Recreation (2)	.286	.289	.279	.336
Companions (4)	.561	.557	.603	.617
Procriminal Attitudes (4)	.512	.429	.536	.543
Substance Abuse (8)	.844	.800	.798	.819
Antisocial Pattern (4)	.453	.208	.278	.366

Table C 10. Alpha scores for total LSI-OR and subcomponents by disposition group for Other females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.866	.824	.889	.888
Overall (40)	.857	.811	.879	.879
Criminal History (8)	.835	.806	.773	.812
Education / Employment (9)	.766	.789	.854	.842
Family / Marital (4)	.567	.078	.412	.370
Leisure / Recreation (2)	-.053	.379	.283	.307
Companions (4)	.365	.514	.588	.573
Procriminal Attitudes (4)	.279	.528	.607	.601
Substance Abuse (8)	.903	.871	.883	.885
Antisocial Pattern (4)	.270	.087	.355	.300

Table C 11. Alpha scores for total LSI-OR and subcomponents by disposition group for Unknown males

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.893	.852	.824	.853
Overall (40)	.879	.841	.813	.842
Criminal History (8)	.787	.750	.721	.777
Education / Employment (9)	.808	.785	.802	.805
Family / Marital (4)	.301	.429	.310	.333
Leisure / Recreation (2)	.319	.437	.346	.375
Companions (4)	.478	.491	.558	.550
Procriminal Attitudes (4)	.335	.527	.465	.479
Substance Abuse (8)	.824	.814	.793	.801
Antisocial Pattern (4)	.475	.176	.185	.252

Table C 12. Alpha scores for total LSI-OR and subcomponents by disposition group for Unknown females

Scale (number of items)	Custodial	Conditional	Probation	All
Overall (43)	.923	.852	.828	.851
Overall (40)	.916	.847	.817	.841
Criminal History (8)	.621	.683	.668	.712
Education / Employment (9)	.817	.821	.838	.838
Family / Marital (4)	.331	.428	.334	.350
Leisure / Recreation (2)	.606	.268	.334	.337
Companions (4)	.668	.503	.548	.556
Procriminal Attitudes (4)	.193	.577	.454	.469
Substance Abuse (8)	.870	.856	.811	.830
Antisocial Pattern (4)	.521	.079	.236	.283

Appendix D

Table D 1. Mean and LSI-OR score by disposition and racial groups for males

	Custodial (SD)	**Conditional(SD)**	**Probation (SD)**	**Total (SD)**
Aboriginal	28.25(7.529)	19.26(8.131)	16.27(7.708)	21.83(9.580)
Black	20.37(7.729)	11.93(7.533)	9.92(6.878)	12.97(8.497)
Caucasian	22.81(7.939)	12.24(7.341)	10.80(6.879)	13.87(8.810)
Other	17.82(8.316)	8.62(5.888)	7.66(5.823)	9.19(7.123)
Unknown	15.25(7.998)	7.13(5.624)	6.97(5.150)	7.48(5.753)
Total	22.57(8.402)	11.24(7.490)	9.85(6.823)	12.75(8.914)

Table D 2. Cohen's d and effect size for the total sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	21.83(9.580)	Black	12.97(8.497)	0.978	0.439
Aboriginal	21.83(9.580)	Caucasian	13.87(8.810)	0.865	0.397
Aboriginal	21.83(9.580)	Other	9.19(7.123)	1.497	0.599
Aboriginal	21.83(9.580)	Unknown	7.48(5.753)	1.816	0.672
Black	12.97(8.497)	Caucasian	13.87(8.810)	-0.104	-0.052
Black	12.97(8.497)	Other	9.19(7.123)	0.482	0.234
Black	12.97(8.497)	Unknown	7.48(5.753)	0.757	0.354
Caucasian	13.87(8.810)	Other	9.19(7.123)	0.584	0.280
Caucasian	13.87(8.810)	Unknown	7.48(5.753)	0.859	0.395
Other	9.19(7.123)	Unknown	7.48(5.753)	0.264	0.131

Table D 3. Cohen's d and effect size for the male custodial sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	28.25(7.529)	Black	20.37(7.729)	1.033	0.459
Aboriginal	28.25(7.529)	Caucasian	22.81(7.939)	0.703	0.332
Aboriginal	28.25(7.529)	Other	17.82(8.316)	1.315	0.549
Aboriginal	28.25(7.529)	Unknown	15.25(7.998)	1.674	0.642
Black	20.37(7.729)	Caucasian	22.81(7.939)	-0.311	-0.154
Black	20.37(7.729)	Other	17.82(8.316)	0.318	0.157
Black	20.37(7.729)	Unknown	15.25(7.998)	0.617	0.295
Caucasian	22.81(7.939)	Other	17.82(8.316)	0.614	0.293
Caucasian	22.81(7.939)	Unknown	15.25(7.998)	0.949	0.429
Other	17.82(8.316)	Unknown	15.25(7.998)	0.315	0.156

Table D 4. Cohen's d and effect size for the male conditional sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	19.26(8.131)	Black	11.93(7.533)	0.935	0.424
Aboriginal	19.26(8.131)	Caucasian	12.24(7.341)	0.906	0.413
Aboriginal	19.26(8.131)	Other	8.62(5.888)	1.499	0.600
Aboriginal	19.26(8.131)	Unknown	7.13(5.624)	1.735	0.655
Black	11.93(7.533)	Caucasian	12.24(7.341)	-0.042	-0.021
Black	11.93(7.533)	Other	8.62(5.888)	0.490	0.238
Black	11.93(7.533)	Unknown	7.13(5.624)	0.722	0.340
Caucasian	12.24(7.341)	Other	8.62(5.888)	0.544	0.262
Caucasian	12.24(7.341)	Unknown	7.13(5.624)	0.781	0.364
Other	8.62(5.888)	Unknown	7.13(5.624)	0.259	0.128

Table D 5. Cohen's d and effect size for the male probation sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	16.27(7.708)	Black	9.92(6.878)	0.869	0.399
Aboriginal	16.27(7.708)	Caucasian	10.80(6.879)	0.749	0.351
Aboriginal	16.27(7.708)	Other	7.66(5.823)	1.260	0.533
Aboriginal	16.27(7.708)	Unknown	6.97(5.150)	1.419	0.579
Black	9.92(6.878)	Caucasian	10.80(6.879)	-0.128	-0.064
Black	9.92(6.878)	Other	7.66(5.823)	0.355	0.175
Black	9.92(6.878)	Unknown	6.97(5.150)	0.486	0.236
Caucasian	10.80(6.879)	Other	7.66(5.823)	0.493	0.239
Caucasian	10.80(6.879)	Unknown	6.97(5.150)	0.630	0.301
Other	7.66(5.823)	Unknown	6.97(5.150)	0.126	0.063

Table D 6. Mean and LSI-OR score by disposition and racial groups for females

	Custodial (SD)	**Conditional(SD)**	**Probation (SD)**	**Total (SD)**
Aboriginal	29.61(7.108)	17.58(8.196)	15.21(7.699)	17.10(8.860)
Black	22.13(6.217)	11.23(6.790)	8.25(6.208)	9.52(7.069)
Caucasian	23.10(8.314)	12.19(7.743)	10.57(7.066)	11.73(7.967)
Other	18.21(7.040)	9.06(5.673)	7.62(6.469)	8.31(6.672)
Unknown	20.20(9.379)	6.92(5.534)	7.32(5.2)	7.51(5.624)
Total	23.59(8.494)	11.27(7.702)	9.82(6.969)	10.88(7.895)

Table D 7. Cohen's d and effect size for the total female sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	17.10(8.860)	Black	9.52(7.069)	0.946	0.427
Aboriginal	17.10(8.860)	Caucasian	11.73(7.967)	0.637	0.304
Aboriginal	17.10(8.860)	Other	8.31(6.672)	1.121	0.489
Aboriginal	17.10(8.860)	Unknown	7.51(5.624)	1.292	0.543
Black	9.52(7.069)	Caucasian	11.73(7.967)	-0.293	-0.145
Black	9.52(7.069)	Other	8.31(6.672)	0.176	0.088
Black	9.52(7.069)	Unknown	7.51(5.624)	0.315	0.155
Caucasian	11.73(7.967)	Other	8.31(6.672)	0.465	0.227
Caucasian	11.73(7.967)	Unknown	7.51(5.624)	0.612	0.293
Other	8.31(6.672)	Unknown	7.51(5.624)	0.130	0.065

Table D 8. Cohen's d and effect size for the female custodial sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	29.61(7.108)	Black	22.13(6.217)	1.120	0.489
Aboriginal	29.61(7.108)	Caucasian	23.10(8.314)	0.842	0.388
Aboriginal	29.61(7.108)	Other	18.21(7.040)	1.612	0.627
Aboriginal	29.61(7.108)	Unknown	20.20(9.379)	1.131	0.492
Black	22.13(6.217)	Caucasian	23.10(8.314)	-0.132	-0.066
Black	22.13(6.217)	Other	18.21(7.040)	0.590	0.283
Black	22.13(6.217)	Unknown	20.20(9.379)	0.243	0.120
Caucasian	23.10(8.314)	Other	18.21(7.040)	0.635	0.303
Caucasian	23.10(8.314)	Unknown	20.20(9.379)	0.327	0.161
Other	18.21(7.040)	Unknown	20.20(9.379)	-0.240	-0.119

Table D 9. Cohen's d and effect size for the female conditional sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	17.58(8.196)	Black	11.23(6.790)	0.844	0.389
Aboriginal	17.58(8.196)	Caucasian	12.19(7.743)	0.676	0.320
Aboriginal	17.58(8.196)	Other	9.06(5.673)	1.209	0.517
Aboriginal	17.58(8.196)	Unknown	6.92(5.534)	1.524	0.606
Black	11.23(6.790)	Caucasian	12.19(7.743)	-0.132	-0.066
Black	11.23(6.790)	Other	9.06(5.673)	0.347	0.171
Black	11.23(6.790)	Unknown	6.92(5.534)	0.696	0.329
Caucasian	12.19(7.743)	Other	9.06(5.673)	0.461	0.225
Caucasian	12.19(7.743)	Unknown	6.92(5.534)	0.783	0.365
Other	9.06(5.673)	Unknown	6.92(5.534)	0.382	0.188

Table D 10. Cohen's d and effect size for the female probation sample separated by race

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	15.21(7.699)	Black	8.25(6.208)	0.995	0.446
Aboriginal	15.21(7.699)	Caucasian	10.57(7.066)	0.628	0.300
Aboriginal	15.21(7.699)	Other	7.62(6.469)	1.067	0.471
Aboriginal	15.21(7.699)	Unknown	7.32(5.200)	1.201	0.515
Black	8.25(6.208)	Caucasian	10.57(7.066)	-0.349	-0.171
Black	8.25(6.208)	Other	7.62(6.469)	0.099	0.050
Black	8.25(6.208)	Unknown	7.32(5.200)	0.162	0.081
Caucasian	10.57(7.066)	Other	7.62(6.469)	0.435	0.213
Caucasian	10.57(7.066)	Unknown	7.32(5.200)	0.524	0.253
Other	7.62(6.469)	Unknown	7.32(5.200)	0.051	0.026

Appendix E

Table E 1. Correlations between OSS and LSI Total Score for males

	Custodial	**Conditional**	**Probation**	**Total**
Aboriginal	.192***	-.077	.060	.177***
Black	.160**	.009	.064	.235***
Caucasian	.179***	-.030	.074***	.169***
Other	-.034	-.043	.023	.094***
Unknown	.167*	.037	-.003	.059***
Total	.132***	-.034	.053***	.151***

*p=.05, **p=.01, ***p<.001

Table E 2. Correlations between OSS and LSI Total Score for females

	Custodial	**Conditional**	**Probation**	**Total**
Aboriginal	.128	-.046	.035	.099*
Black	-.052	-.095	-.075	.004
Caucasian	.127	-.071	.026	.085***
Other	-.607*	-.117	-.102	-.082
Unknown	.400	.016	-.061	.897
Total	.075	-.070	-.011	.047**

*p=.05, **p=.01, ***p<.001

Appendix F

Table F 1. Correlation of LSI-OR with general recidivism by disposition for men

	Whole Sample (n=21616)	**Custodial (n=4655)**	**Conditional (n=2518)**	**Probation (n=14443)**
Total Section A	.439***	.382***	.408***	.333***
Total Strengths	-.117***	-.065***	-.089***	-.075***
Criminal History	.420***	.418***	.397***	.287***
Education/Employment	.320***	.255***	.273***	.224***
Family/Marital	.184***	.153***	.161***	.113***
Leisure/Recreation	.256***	.196***	.180***	.164***
Companions	.322***	.275***	.267***	.228***
Procriminal Attitudes	.249***	.205***	.170***	.141***
Substance Abuse	.288***	.225***	.245***	.198***
Antisocial Patterns	.340***	.311***	.271***	.217***
Total Section B	.325***	.274***	.251***	.193***
Personal Problems	.307***	.248***	.224***	.185***
Perpetration History	.250***	.218***	.197***	.121***
Total Section C	.290***	.228***	.178***	.102***
Total Section F	.225***	.165***	.135***	.121***
Social, Health, Mental Health	.202***	.150***	.126***	.118***
Barrier to Release	.224***	.110***	.137***	.068***
Total Section G	.188***	.145***	.087***	.102***

*=<.05, **=<.01, ***=<.001

Table F 2. Correlation of LSI-OR with general recidivism by disposition for females

	Whole Sample (n=4834)	**Custodial (n=295)**	**Conditional (n=707)**	**Probation (n=3832)**
Total Section A	.426***	.380***	.451***	.371***
Total Strengths	-.107***	-.119*	-.109**	-.086***
Criminal History	.372***	.460***	.437***	.282***
Education/Employment	.294***	.210***	.261***	.267***
Family/Marital	.186***	.147*	.191***	.162***
Leisure/Recreation	.211***	.314***	.174***	.162***
Companions	.285***	.209***	.268***	.243***
Procriminal Attitudes	.218***	.169**	.221***	.160***
Substance Abuse	.318***	.272***	.306***	.270***
Antisocial Patterns	.289***	.267***	.348***	.214***
Total Section B	.299***	.255***	.369***	.224***
Personal Problems	.301***	.284***	.353***	.228***
Perpetration History	.177***	.148*	.238***	.111***
Total Section C	.206***	.227***	.140***	.102***
Total Section F	.225***	.151*	.180***	.185***
Social, Health, Mental Health	.214***	.077	.177***	.182***
Barrier to Release	.209***	.259***	.085*	.101***
Total Section G	.163***	.102	.161***	.123***

*=<.05, **=<.01, ***=<.001

Table F 3. Correlation of LSI-OR with general recidivism by racial group

	Aboriginal (n=1692)	**Black (n=1918)**	**Caucasian (n=15646)**	**Other (n=2697)**	**Unknown (n=4497)**
Total Section A	.377***	.420***	.417***	.364***	.250***
Total Strengths	-.139***	-.078**	-.123***	-.067***	-.069***
Criminal History	.354***	.393***	.392***	.327***	.202***
Education/Employment	.268***	.302***	.295***	.253***	.150***
Family/Marital	.135***	.152***	.152***	.092***	.099***
Leisure/Recreation	.230***	.243***	.246***	.195***	.126***
Companions	.240***	.292***	.300***	.289***	.148***
Procriminal Attitudes	.264***	.234***	.228***	.187***	.110***
Substance Abuse	.280***	.255***	.275***	.211***	.160***
Antisocial Patterns	.318***	.318***	.319***	.242***	.156***
Total Section B	.300***	.289***	.303***	.210***	.163***
Personal Problems	.298***	.275***	.293***	.200***	.168***
Perpetration History	.229***	.217***	.214***	.150***	.079***
Total Section C	.251***	.220***	.270***	.201***	.147***
Total Section F	.199***	.209***	.185***	.143***	.092***
Social, Health, Mental Health	.171***	.191***	.163***	.123***	.085***
Barrier to Release	.251***	.152***	.208***	.167***	.091***
Total Section G	.221***	.183***	.174***	.090***	.081***

*=<.05, **=<.01, ***=<.001

Table F 4. Correlation of LSI-OR with general recidivism by racial group for males

	Aboriginal (n=1274)	Black (n=1622)	Caucasian (n=12951)	Other (n=2344)	Unknown (n=3425)
Total Section A	.378***	.406***	.411***	.367***	.249***
Total Strengths	-.115***	-.073***	-.122***	-.076***	-.064***
Criminal History	.350***	.371***	.390***	.330***	.215***
Education/Employment	.271***	.309***	.297***	.268***	.143***
Family/Marital	.162***	.164***	.159***	-.094***	.094***
Leisure/Recreation	.231***	.238***	.247***	.194***	.135***
Companions	.235***	.293***	.302***	.298***	.146***
Procriminal Attitudes	.279***	.229***	.220***	.186***	.118***
Substance Abuse	.270***	.224***	.264***	.199***	.154***
Antisocial Patterns	.338***	.311***	.317***	.246***	.154***
Total Section B	.299***	.269***	.299***	.199***	.168***
Personal Problems	.298***	.259***	.286***	.188***	.166***
Perpetration History	.226***	.198***	.215***	.144***	.095***
Total Section C	.258***	.205***	.273***	.200***	.158***
Total Section F	.237***	.219***	.196***	.147***	.098***
Social, Health, Mental Health	.210***	.205***	.174***	.127***	.091***
Barrier to Release	.250***	.127***	.205***	.162***	.090***
Total Section G	.243***	.161***	.166***	.083***	.088***

*=<.05, **=<.01, ***=<.001

Table F 5. Correlation of LSI-OR with general recidivism by racial group for females

	Aboriginal (n=418)	**Black (n=296)**	**Caucasian (n=2695)**	**Other (n=353)**	**Unknown (n=1072)**
Total Section A	.306***	.421***	.431***	.313***	.255***
Total Strengths	-.166**	-.078	-.112***	.010	-.083**
Criminal History	.277***	.432***	.369***	.244***	.154***
Education/Employment	.239***	.227***	.305***	.193***	.176***
Family/Marital	.089	.172**	.166***	.143**	.123***
Leisure/Recreation	.169**	.171**	.229***	.153**	.097**
Companions	.206***	.219***	.281***	.182**	.152***
Procriminal Attitudes	.139**	.181**	.240***	.153**	.080**
Substance Abuse	.250***	.359***	.303***	.257***	.181***
Antisocial Patterns	.177***	.273***	.302***	.181**	.162***
Total Section B	.213***	.294***	.290***	.212***	.146***
Personal Problems	.216***	.270***	.302***	.226***	.173***
Perpetration History	.143**	.188**	.152***	.087	.015
Total Section C	.107*	.241***	.209***	.149**	.102**
Total Section F	.123*	.260***	.217***	.255***	.093**
Social, Health, Mental Health	.113*	.244***	.205***	.247***	.089**
Barrier to Release	.159**	.281***	.206***	.178**	.108***
Total Section G	.058	.199**	.184***	.111*	.051

*=<.05, **=<.01, ***=<.001

Table F 6. A test of significance between correlations for Aboriginal and Black offenders

	Aboriginal (n=1692)	Black (n=1918)	Z	P
Total Section A	.377***	.420***	-1.53	.126
Total Strengths	-.139***	-.078**	-1.85	.064
Criminal History	.354***	.393***	-1.36	.174
Education/Employment	.268***	.302***	-1.11	.267
Family/Marital	.135***	.152***	-.52	.603
Leisure/Recreation	.230***	.243***	-.41	.682
Companions	.240***	.292***	-1.68	.093
Procriminal Attitudes	.264***	.234***	.96	.337
Substance Abuse	.280***	.255***	.81	.418
Antisocial Patterns	.318***	.318***	0	1.000
Total Section B	.300***	.289***	.36	.719
Personal Problems	.298***	.275***	.75	.453
Perpetration History	.229***	.217***	.38	.704
Total Section C	.251***	.220***	.98	.327
Total Section F	.199***	.209***	-.31	.757
Social, Health, Mental Health	.171***	.191***	-.62	.535
Barrier to Release	.251***	.152***	3.09	.002
Total Section G	.221***	.183***	1.19	.234

Table F 7. A test of significance between correlations for Aboriginal and Caucasian offenders

	Aboriginal (n=1692)	Caucasian (n=15646)	Z	P
Total Section A	.377***	.417***	-1.85	.064
Total Strengths	-.139***	-.123***	-.64	.522
Criminal History	.354***	.392***	-1.72	.085
Education/Employment	.268***	.295***	-1.15	.250
Family/Marital	.135***	.152***	-.68	.496
Leisure/Recreation	.230***	.246***	-.66	.509
Companions	.240***	.300***	-2.53	.011
Procriminal Attitudes	.264***	.228***	1.5	.133
Substance Abuse	.280***	.275***	.21	.834
Antisocial Patterns	.318***	.319***	-.04	.968
Total Section B	.300***	.303***	-.13	.897
Personal Problems	.298***	.293***	.21	.834
Perpetration History	.229***	.214***	.62	.535
Total Section C	.251***	.270***	-.8	.424
Total Section F	.199***	.185***	.57	.569
Social, Health, Mental Health	.171***	.163***	.32	.749
Barrier to Release	.251***	.208***	1.77	.077
Total Section G	.221***	.174***	1.91	.056

Table F 8. A test of significance between correlations for Black and Caucasian offenders

	Black (n=1918)	Caucasian (n=15646)	Z	P
Total Section A	.420***	.417***	.15	.881
Total Strengths	-.078**	-.123***	1.88	.060
Criminal History	.393***	.392***	.05	.960
Education/Employment	.302***	.295***	.32	.749
Family/Marital	.152***	.152***	0	1.000
Leisure/Recreation	.243***	.246***	-.13	.897
Companions	.292***	.300***	-.36	.719
Procriminal Attitudes	.234***	.228***	.26	.795
Substance Abuse	.255***	.275***	-.89	.374
Antisocial Patterns	.318***	.319***	-.05	.960
Total Section B	.289***	.303***	-.63	.529
Personal Problems	.275***	.293***	-.81	.418
Perpetration History	.217***	.214***	.13	.897
Total Section C	.220***	.270***	-2.2	.028
Total Section F	.209***	.185***	1.03	.303
Social, Health, Mental Health	.191***	.163***	1.19	.234
Barrier to Release	.152***	.208***	-2.39	.017
Total Section G	.183***	.174***	.38	.704

Table F 9. A test of significance between correlations for males and females

	Male (n=21616)	Female (n=4834)	Z	P
Total Section A	.439***	.426***	1	.317
Total Strengths	-.117***	-.107***	-.064	.522
Criminal History	.420***	.372***	3.58	<.001
Education/Employment	.320***	.294***	1.8	.036
Family/Marital	.184***	.186***	-.13	.897
Leisure/Recreation	.256***	.211***	2.99	.003
Companions	.322***	.285***	2.56	.010
Procriminal Attitudes	.249***	.218***	2.06	.039
Substance Abuse	.288***	.318***	-2.08	.038
Antisocial Patterns	.340***	.289***	3.56	<.001
Total Section B	.325***	.299***	1.81	.070
Personal Problems	.307***	.301***	0.42	.674
Perpetration History	.250***	.177***	4.81	<.001
Total Section C	.290***	.206***	5.63	<.001
Total Section F	.225***	.225***	0	1.00
Social, Health, Mental Health	.202***	.214***	-.79	.430
Barrier to Release	.224***	.209***	.99	.322
Total Section G	.188***	.163***	1.62	.105

Table F 10. A test of significance between correlations for Aboriginal and Black male offenders

	Aboriginal (n=1274)	Black (n=1622)	Z	P
Total Section A	.378***	.406***	-.883	.377
Total Strengths	-.115***	-.073***	-1.131	.258
Criminal History	.350***	.371***	-.0644	.520
Education/Employment	.271***	.309***	-1.107	.268
Family/Marital	.162***	.164***	-.055	.956
Leisure/Recreation	.231***	.238***	-.198	.843
Companions	.235***	.293***	-1.664	.096
Procriminal Attitudes	.279***	.229***	1.427	.154
Substance Abuse	.270***	.224***	1.308	.191
Antisocial Patterns	.338***	.311***	.805	.421
Total Section B	.299***	.269***	.871	.384
Personal Problems	.298***	.259***	1.128	.259
Perpetration History	.226***	.198***	.782	.434
Total Section C	.258***	.205***	1.495	.135
Total Section F	.237***	.219***	.507	.612
Social, Health, Mental Health	.210***	.205***	.139	.889
Barrier to Release	.250***	.127***	3.408	<.001
Total Section G	.243***	.161***	2.283	.022

Table F 11. A test of significance between correlations for Aboriginal and Caucasian male offenders

	Aboriginal (n=1274)	Caucasian (n=12951)	Z	P
Total Section A	.378***	.411***	-1.33	.184
Total Strengths	-.115***	-.122***	.242	.405
Criminal History	.350***	.390***	-1.577	.115
Education/Employment	.271***	.297***	-.962	.336
Family/Marital	.162***	.159***	.105	.917
Leisure/Recreation	.231***	.247***	-.577	.564
Companions	.235***	.302***	-2.458	.014
Procriminal Attitudes	.279***	.220***	2.141	.032
Substance Abuse	.270***	.264***	.220	.826
Antisocial Patterns	.338***	.317***	.800	.424
Total Section B	.299***	.299***	.000	1.000
Personal Problems	.298***	.286***	.446	.655
Perpetration History	.226***	.215***	.393	.694
Total Section C	.258***	.273***	-.583	.583
Total Section F	.237***	.196***	1.464	.143
Social, Health, Mental Health	.210***	.174***	1.272	.203
Barrier to Release	.250***	.205***	1.615	.106
Total Section G	.243***	.166***	2.736	.006

Table F 12. A test of significance between correlations for Black and Caucasian male offenders

	Black (n=1622)	Caucasian (n=12951)	Z	P
Total Section A	.406***	.411***	-.228	.820
Total Strengths	-.073***	-.122***	1.877	.061
Criminal History	.371***	.390***	-.843	.399
Education/Employment	.309***	.297***	.501	.616
Family/Marital	.164***	.159***	.195	.846
Leisure/Recreation	.238***	.247***	-.363	.717
Companions	.293***	.302***	-.375	.708
Procriminal Attitudes	.229***	.220***	.360	.720
Substance Abuse	.224***	.264***	-1.614	.107
Antisocial Patterns	.311***	.317***	-.253	.800
Total Section B	.269***	.299***	-1.238	.216
Personal Problems	.259***	.286***	-1.106	.269
Perpetration History	.198***	.215***	-.674	.501
Total Section C	.205***	.273***	-2.737	.006
Total Section F	.219***	.196***	.912	.362
Social, Health, Mental Health	.205***	.174***	1.22	.223
Barrier to Release	.127***	.205***	-3.045	.002
Total Section G	.161***	.166***	-.195	.845

Table F 13. A test of significance between correlations for Aboriginal and Black female offenders

	Aboriginal (n=418)	**Black (n=296)**	Z	P
Total Section A	.306***	.421***	-1.74	.082
Total Strengths	-.166**	-.078	-1.171	.241
Criminal History	.277***	.432***	-2.332	.020
Education/Employment	.239***	.227***	0.166	.868
Family/Marital	.089	.172**	-1.107	.268
Leisure/Recreation	.169**	.171**	-.027	.978
Companions	.206***	.219***	-.178	.858
Procriminal Attitudes	.139**	.181**	-.565	.572
Substance Abuse	.250***	.359***	-1.577	.115
Antisocial Patterns	.177***	.273***	-1.326	.185
Total Section B	.213***	.294***	1.135	.256
Personal Problems	.216***	.270***	-.752	.452
Perpetration History	.143**	.188**	-.606	.544
Total Section C	.107*	.241***	-1.814	.070
Total Section F	.123*	.260***	-1.867	.062
Social, Health, Mental Health	.113*	.244***	-1.776	.076
Barrier to Release	.159**	.281***	-1.683	.092
Total Section G	.058	.199**	-1.882	.060

Table F 14. A test of significance between correlations for Aboriginal and Caucasian female offenders

	Aboriginal (n=418)	**Caucasian (n=2695)**	Z	P
Total Section A	.306***	.431***	-2.749	.006
Total Strengths	-.166**	-.112***	-1.044	.296
Criminal History	.277***	.369***	-1.95	.051
Education/Employment	.239***	.305***	-1.352	.176
Family/Marital	.089	.166***	-1.485	.138
Leisure/Recreation	.169**	.229***	-1.185	.236
Companions	.206***	.281***	-1.513	.130
Procriminal Attitudes	.139**	.240***	-1.989	.047
Substance Abuse	.250***	.303***	-1.089	.276
Antisocial Patterns	.177***	.302***	-2.519	.012
Total Section B	.213***	.290***	-1.56	.119
Personal Problems	.216***	.302***	-1.75	.080
Perpetration History	.143**	.152***	-.174	.862
Total Section C	.107*	.209***	-1.986	.047
Total Section F	.123*	.217***	-1.837	.066
Social, Health, Mental Health	.113*	.205***	-1.791	.073
Barrier to Release	.159**	.206***	-.922	.356
Total Section G	.058	.184***	-2.428	.015

Table F 15. A test of significance between correlations for Black and Caucasian female offenders

	Black (n=296)	**Caucasian (n=2695)**	Z	P
Total Section A	.421***	.431***	-.199	.843
Total Strengths	-.078	-.112***	.558	.577
Criminal History	.432***	.369***	1.221	.222
Education/Employment	.227***	.305***	-1.365	.172
Family/Marital	.172**	.166***	.100	.920
Leisure/Recreation	.171**	.229***	-.982	.326
Companions	.219***	.281***	-1.075	.141
Procriminal Attitudes	.181**	.240***	-1.004	.315
Substance Abuse	.359***	.303***	1.023	.306
Antisocial Patterns	.273***	.302***	-.514	.607
Total Section B	.294***	.290***	.071	.943
Personal Problems	.270***	.302***	-.567	.571
Perpetration History	.188**	.152***	.603	.547
Total Section C	.241***	.209***	.548	.584
Total Section F	.260***	.217***	.741	.459
Social, Health, Mental Health	.244***	.205***	.668	.504
Barrier to Release	.281***	.206***	1.297	.195
Total Section G	.199**	.184***	.253	.800

Table F 16. Correlation with violent recidivism by disposition group for males

	Whole Sample (n=21616)	**Custodial (n=4655)**	**Conditional (n=2518)**	**Probation (n=14443)**
Total Section A	.296***	.239***	.276***	.172***
Total Strengths	-.078***	-.066***	-.038	-.041***
Criminal History	.291***	.268***	.253***	.157***
Education/Employment	.232***	.170***	.026***	.148***
Family/Marital	.097***	.075***	.098***	.022**
Leisure/Recreation	.180***	.138***	.107***	.100***
Companions	.238***	.190***	.215***	.152***
Procriminal Attitudes	.160***	.125***	.106***	.047***
Substance Abuse	.166***	.122***	.148***	.065***
Antisocial Patterns	.240***	.201***	.210***	.110***
Total Section B	.166***	.078***	.110***	.037***
Personal Problems	.169***	.090***	.117***	.050***
Perpetration History	.111***	.037*	.062**	.001
Total Section C	.227***	.138***	.154***	.065***
Total Section F	.152***	.081***	.105***	.059***
Social, Health, Mental Health	.133***	.073***	.099***	.058***
Barrier to Release	.170***	.058***	.100***	.024**
Total Section G	.099***	.037*	.041*	.026**

Table F 17. Correlation with violent recidivism by disposition group for females

	Whole Sample (n=4834)	**Custodial (n=295)**	**Conditional (n=707)**	**Probation (n=3832)**
Total Section A	.246***	.206***	.336***	.183***
Total Strengths	-.061***	-.002	-.059	-.050**
Criminal History	.254***	.252***	.333***	.183***
Education/Employment	.167***	.119*	.199***	.137***
Family/Marital	.114***	.100	.126***	.094***
Leisure/Recreation	.116***	.174**	.133***	.073***
Companions	.168***	.114*	.196***	.130***
Procriminal Attitudes	.128***	.086	.184***	.074***
Substance Abuse	.148***	.125*	.211***	.090***
Antisocial Patterns	.168***	.166**	.281***	.091***
Total Section B	.122***	.081	.209***	.052***
Personal Problems	.152***	.133*	.256***	.082***
Perpetration History	.024	-.007	.052	-.023
Total Section C	.126***	.128*	.118**	.038*
Total Section F	.142***	.100	.146***	.102***
Social, Health, Mental Health	.133***	.073	.143***	.101***
Barrier to Release	.146***	.191***	.090*	.056***
Total Section G	.085***	.041	.113**	.049**

Table F 18. Correlation with violent recidivism by disposition group for males

	Aboriginal (n=1274)	**Black (n=1622)**	**Caucasian (n=12951)**	**Other (n=2344)**	**Unknown (n=3425)**
Total Section A	.173***	.277***	.313***	.236***	.148***
Total Strengths	-.050	-.023	-.088***	-.064**	-.034*
Criminal History	.217***	.259***	.296***	.214***	.137***
Education/Employment	.137***	.215***	.247***	.184***	.108***
Family/Marital	.050	.108***	.093***	.051*	.038*
Leisure/Recreation	.137***	.131***	.192***	.125***	.090***
Companions	.117***	.216***	.250***	.210***	.116***
Procriminal Attitudes	.112***	.131***	.160***	.123***	.057***
Substance Abuse	.049	.155***	.181***	.103***	.053**
Antisocial Patterns	.164***	.226***	.250***	.165***	.095***
Total Section B	.094***	.163***	.170***	.084***	.037*
Personal Problems	.096***	.151***	.176***	.097***	.050**
Perpetration History	.068*	.128***	.101***	.033	.000
Total Section C	.175***	.176***	.237***	.114***	.114***
Total Section F	.096***	.135***	.157***	.125***	.067***
Social, Health, Mental Health	.083**	.122***	.135***	.108***	.064***
Barrier to Release	.109***	.098***	.188***	.136***	.043*
Total Section G	.099***	.082***	.107***	.025	.029

Table F 19. Correlation with violent recidivism by racial group for females

	Aboriginal (n=418)	**Black (n=296)**	**Caucasian (n=2695)**	**Other (n=353)**	**Unknown (n=1072)**
Total Section A	.202***	.234***	.262***	.140**	.165***
Total Strengths	-.125*	-.053	.052**	.068	-.071*
Criminal History	.275***	.272***	.252***	.158**	.130***
Education/Employment	.116***	.092	.197***	.068	.098***
Family/Marital	.035	.102	.121***	.070	.072*
Leisure/Recreation	.072	.089	.129***	.026	.083*
Companions	.112*	.210***	.169***	.107*	.098***
Procriminal Attitudes	.099*	.135*	.132***	.094	.069*
Substance Abuse	.130**	.133*	.151***	.068	.108***
Antisocial Patterns	.183***	.165**	.161***	.122*	.115***
Total Section B	.151**	.097	.111***	.039	.065*
Personal Problems	.146*	.091	.154***	.060	.109***
Perpetration History	.110*	.059	-.007	-.019	-.053
Total Section C	.143**	.156**	.115***	.117*	.071*
Total Section F	.131**	.077	.145***	.128*	.081**
Social, Health, Mental Health	.124*	.062	.137***	.125*	.076*
Barrier to Release	.120*	.182**	.149***	.061	.126***
Total Section G	.039	.057	.099***	.129*	.018

Appendix G

A Kaplan-Meier survival analysis was performed with the sample broken into disposition group by gender. Male conditional sentence (censor rate=72.1%; 639 days, SE=17.98, SD=476.75), male probation (censor rate=70.6%; 648 days, SE=6.708, SD=437.01), male custody (censor rate=37.8%; 471 days, SE=7.52, SD=404.42), female conditional sentence (censor rate=73.8%; 658 days, SE=35.34, SD=480.71), female probation (censor rate=75.4%; 636 days, SE=13.91, SD=427.16), and female custody (censor rate=37.3%; 480 days, SE=30.33, SD=412.57).

Table G 1. Cohen's d and effect size for males.

Sentence	**Mean (SD)**	**Sentence**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Conditional Sentence	639(476.75)	Custody	471(404.42)	0.380	0.187
Conditional Sentence	639(476.75)	Probation	648(437.01)	-0.020	-0.010
Custody	471(404.42)	Probation	648(437.01)	-0.420	-0.206

Table G 2. Cohen's d and effect size for females.

Sentence	**Mean (SD)**	**Sentence**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Conditional Sentence	658(480.71)	Custody	480(412.57)	0.397	0.195
Conditional Sentence	658(480.71)	Probation	636(427.16)	0.048	0.024
Custody	480(412.57)	Probation	636(427.16)	-0.371	-0.183

Figure G 1. Displays the survival curve separated by disposition for males.

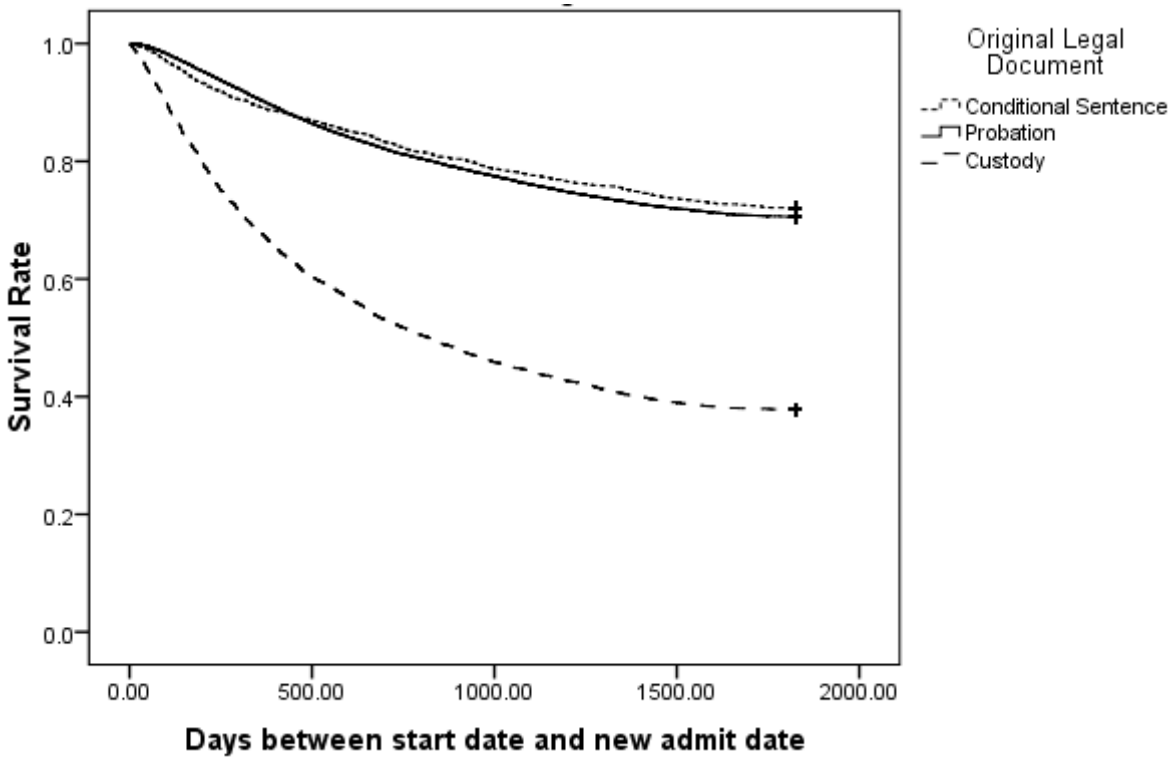
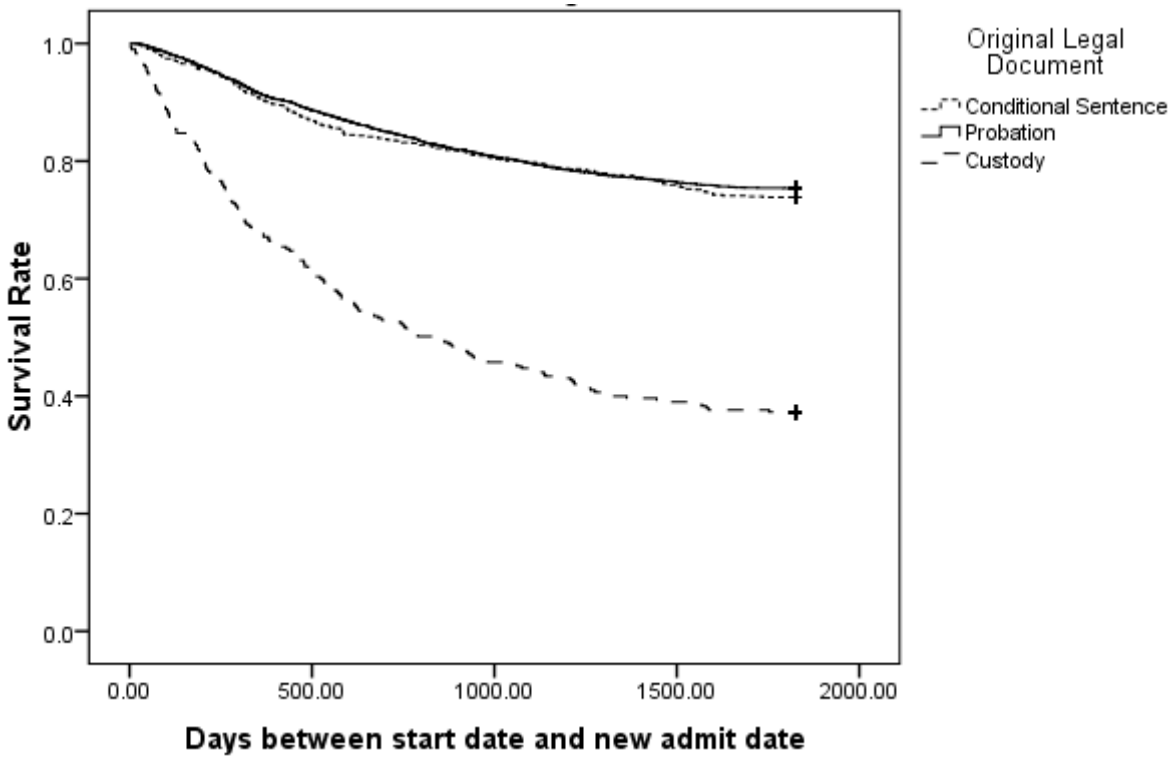


Figure G 2. Displays the survival curve separated by disposition for females



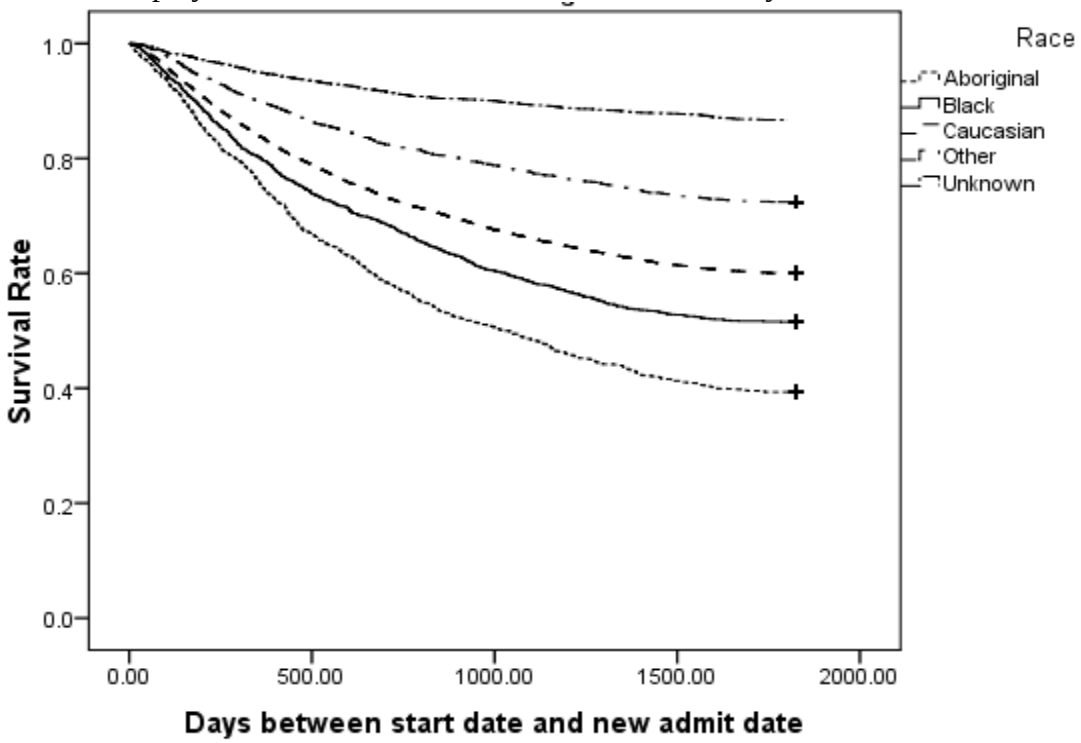
Survival Analyses –Male Race

A Kaplan-Meier survival analysis was performed with the male sample broken into racial groups. A smaller proportion of Unknown race category (censor rate=86.7%) recidivated than the "Other" males (censor rate=72.4%), Caucasian males (censor rate=60.0%), Black males (censor rate=51.5%) and Aboriginal males (censor rate=39.3%). Unknown males had the highest mean survival rate (633 days, SE=22.31, SD=476.46), followed by "Other" males (624 days, SE=17.67, SD=449.43), Caucasian males (577 days, SE=6.04, SD=434.94), Black males (568 days, SE=15.13, SD=424.24), and finally, Aboriginal males (564 days, SE=15.39, SD=427.86).

Table G 3. Cohen's d and effect size for males separated by race.

Race	Mean (SD)	Race	Mean (SD)	Cohen's *d*	Effect Size *r*
Aboriginal	564(427.86)	Black	568(424.24)	-0.009	-0.004
Aboriginal	564(427.86)	Caucasian	577(434.94)	-0.030	-0.015
Aboriginal	564(427.86)	Other	624(449.43)	-0.137	-0.068
Aboriginal	564(427.86)	Unknown	633(476.46)	-0.152	-0.076
Black	568(424.24)	Caucasian	577(434.94)	-0.021	-0.010
Black	568(424.24)	Other	624(449.43)	-0.128	-0.064
Black	568(424.24)	Unknown	633(476.46)	-0.144	-0.072
Caucasian	577(434.94)	Other	624(449.43)	-0.106	-0.053
Caucasian	577(434.94)	Unknown	633(476.46)	-0.123	-0.061
Other	624(449.43)	Unknown	633(476.46)	-0.019	-0.010

Figure G 3. Displays the survival curve for all male offenders by race



Survival Analyses –Female Race

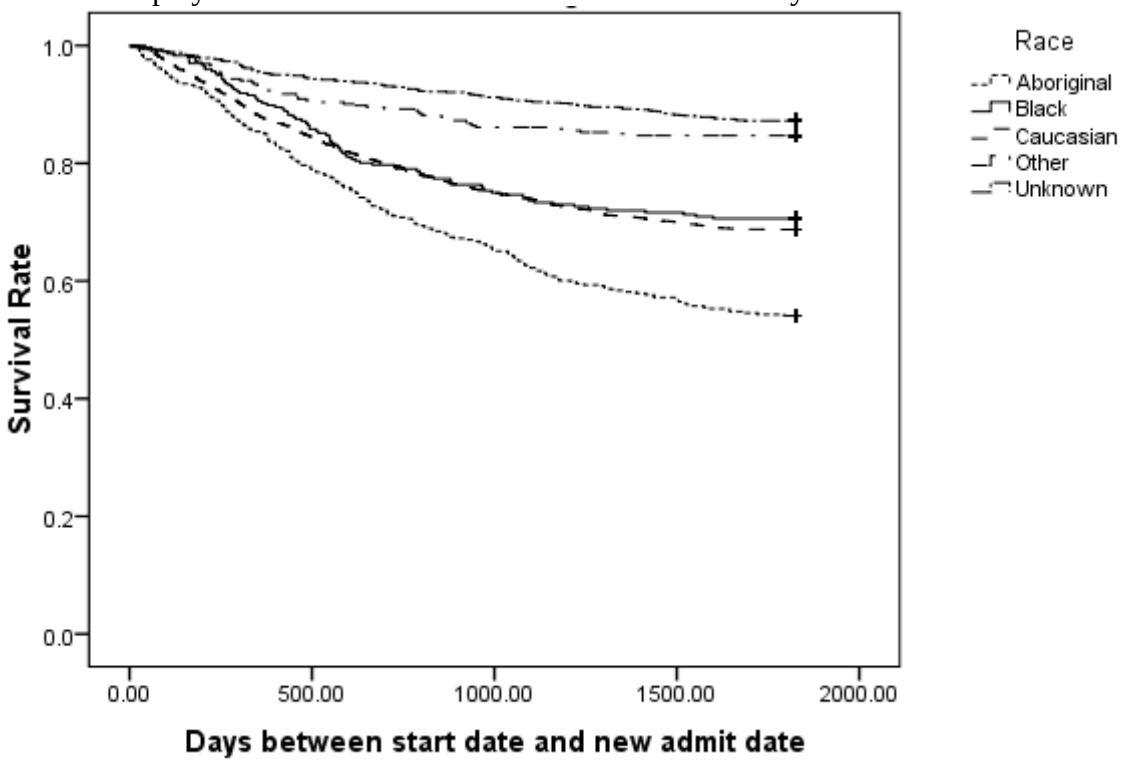
Another Kaplan-Meier survival analysis was performed with the female sample broken into racial groups. A smaller proportion of unknown race recidivated (censor rate=87.2%) than the "Other" race (censor rate=84.7%), Black females (censor rate=70.6%), Caucasian females (censor rate= 68.7%), and Aboriginal females (censor rate=54.1%). Unknown females had the largest mean days to reoffence (721 days, SE=42.56, SD=498.16), followed by Aboriginal females (647 days, SE=32.58, SD=451.42), Caucasian females (603 days, SE=14.82,

SD=430.28), Black females (588 days, SE=39.77, SD=370.91), and "Other" females (509 days, SE=49.07, SD=360.56).

Table G 4. Cohen's d and effect size for females separated by race.

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	647(451.42)	Black	588(370.91)	0.143	0.071
Aboriginal	647(451.42)	Caucasian	603(430.28)	0.100	0.050
Aboriginal	647(451.42)	Other	509(360.56)	0.338	0.167
Aboriginal	647(451.42)	Unknown	721(498.16)	-0.156	-0.078
Black	588(370.91)	Caucasian	603(430.28)	-0.037	-0.019
Black	588(370.91)	Other	509(360.56)	0.216	0.107
Black	588(370.91)	Unknown	721(498.16)	-0.303	-0.150
Caucasian	603(430.28)	Other	509(360.56)	0.237	0.118
Caucasian	603(430.28)	Unknown	721(498.16)	-0.254	-0.126
Other	509(360.56)	Unknown	721(498.16)	-0.488	-0.237

Figure G 4. Displays the survival curve for all female offenders by race



Appendix H

When looking specifically at the male sample, there was a significant difference in the LSI-OR scores for recidivists and non-recidivists for the entire males sample, t (13240) = 67.097, p <.001, the custodial sample, t (3549) = 27.802, p<.001, the probation sample, t (6779) = 39.260, p <.001, and the conditional sample, t (1074) = 20.405, p <.001.

Table H 1. *t*-test of LSI-OR scores between non-recidivists and recidivists by disposition

	Non-Recid	**Recid**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Custodial	18.45(8.038)	25.07(7.596)	27.802	.001	- 0.847	- 0.390
Conditional	9.34(6.380)	16.15(7.906)	20.405	<.001	- 0.948	- 0.428
Probation	8.39(6.040)	13.37(7.296)	39.260	<.001	- 0.744	- 0.348
Total	9.80(7.189)	17.94(9.275)	67.097	<.001	- 0.981	- 0.440

When looking specifically at the female sample, there was a significant difference in the LSI-OR scores for the entire female sample, t (1925) = 29.179, p <.001, the custodial sample, t (186.407) = 6.589, p <.001, the probation sample, t (1347) = 22.298, p <.001, and the conditional sample, t (277.234) = 12.240, p <.001.

Table H 2. *t*-test of LSI-OR scores between non-recidivists and recidivists by disposition

	Non-Recid	**Recid**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Custodial	19.42(9.100)	26.08(7.041)	6.589	<.001	- 0.819	- 0.379
Conditional	9.20(6.486)	17.10(7.883)	12.240	<.001	- 1.094	- 0.480
Probation	8.35(6.105)	14.35(7.489)	22.298	<.001	- 0.878	- 0.402
Total	8.82(6.564)	16.39(8.499)	29.179	<.001	- 0.997	- 0.446

When looking specifically at race for males, LSI-OR scores are higher for recidivists than non-recidivists for the Aboriginal sample, t (1112) = 14.737, p <.001, the Black sample, t (1536) = 17.772, p <.001, the Caucasian sample, t (9626) = 49.323, p <.001, the Other sample, t (894.462) = 16.338, p <.001, and the Unknown sample, t (530.839) = 11.931, p <.001.

Table H 3. *t*-test of LSI-OR scores between non-recidivists and recidivists by racial group

	Non-Recid	**Recid**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Aboriginal	17.34(8.558)	24.75(9.071)	14.737	<.001	-0.840	-0.387
Black	9.63(7.082)	16.53(8.437)	17.772	<.001	-0.886	-0.405
Caucasian	10.92(7.371)	18.30(8.935)	49.323	<.001	-0.901	-0.411
Other	7.58(5.823)	13.43(8.375)	16.338	<.001	-0.811	-0.376
Unknown	6.91(5.265)	11.13(7.265)	11.931	<.001	-0.665	-0.316

When looking specifically at race for females, the LSI-OR scores are higher for recidivists than non-recidivists for the Aboriginal sample, t (416) = 6.563, p<.001, the Black

sample, t (123.949) = 6.944, p <.001, the Caucasian sample, t (1338) = 22.730, p <.001, the Other sample, t (351) = 6.184, p <.001, and the Unknown sample, t (157.635) = 6.807, p <.001.

Table H 4. *t*-test of LSI-OR scores between non-recidivists and recidivists by racial group

	Non-Recid	**Recid**	**t-test**	**P-value**	**Cohen's *d***	**Effect size *r***
Aboriginal	14.60(8.423)	20.04(8.470)	6.563	<.001	-0.644	-0.307
Black	7.61(5.671)	14.13(7.955)	6.944	<.001	-0.944	-0.427
Caucasian	9.42(6.591)	16.83(8.355)	22.730	<.001	-0.985	-0.442
Other	7.42(6.204)	13.22(7.084)	6.184	<.001	-0.871	-0.399
Unknown	6.96(5.154)	11.25(7.106)	6.807	<.001	-0.691	-0.327

Appendix I

For the male sample, the number of true predictions was weighed against the number of false predictions using ROC analysis and reported using the Area Under the Curve. For the raw LSI-OR scores, the AUC = .756 ±.007. Individual disposition groups were also examined: conditional sentence, AUC = .751 ±.021; probation, AUC =.705 ± .010; custodial, AUC =.724 ±.015. All racial groups also displayed a positive AUC: Aboriginal, AUC = .721 ±.028; Black, AUC =.739 ±.024; Caucasian, AUC =.738 ±.009; Other, AUC =.717 ±.024; Unknown, AUC =.680 ±.027.

Figure I 1. ROC Curve for male offenders (AUC = .756).

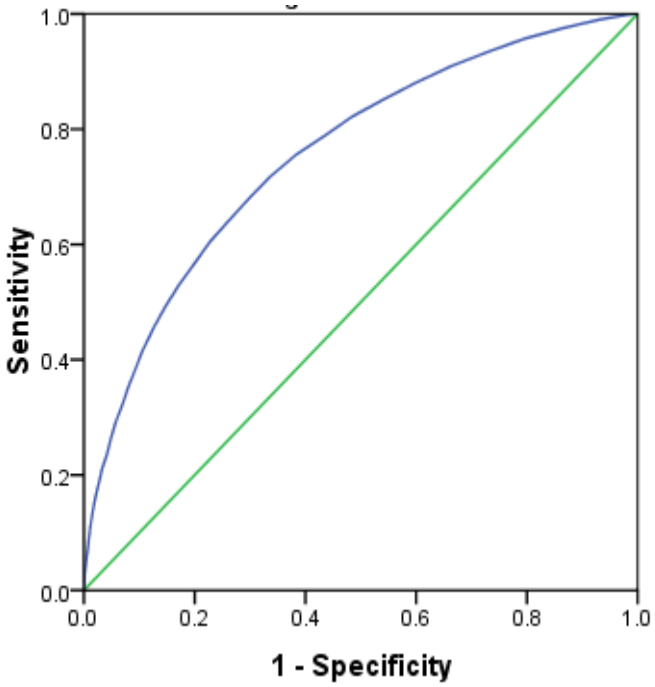


Figure I 2. ROC Curve for male offenders on a conditional sentence (AUC=.751).

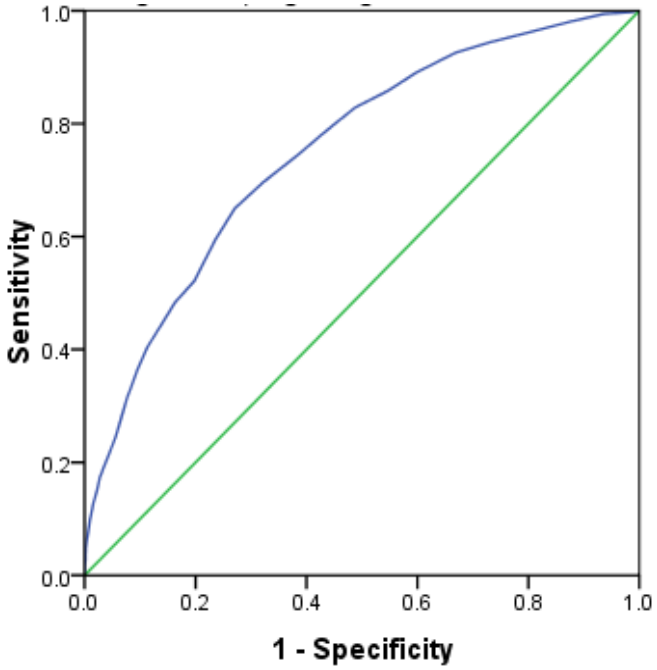


Figure I 3. ROC Curve for male offenders on probation (AUC = .724)

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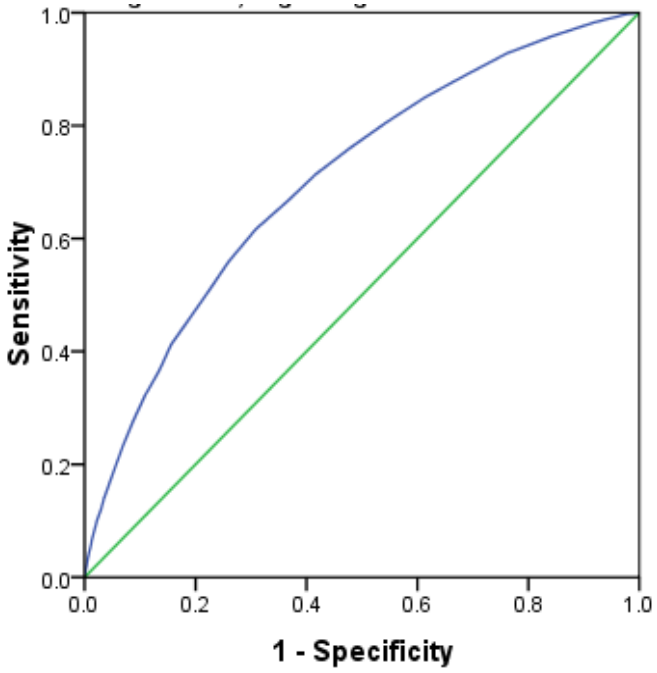


Figure I 4. ROC Curve for male offenders from custody (AUC =.705).

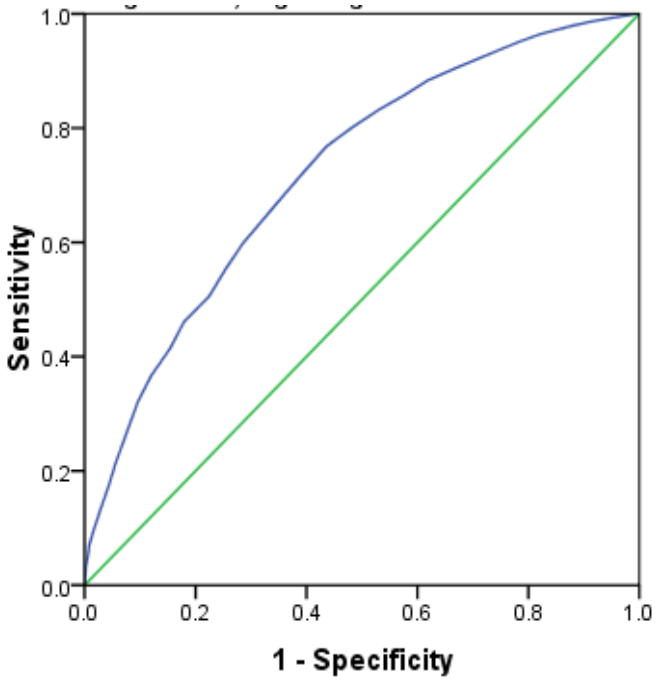


Figure I 5. ROC Curve for Aboriginal male offenders (AUC= .721).

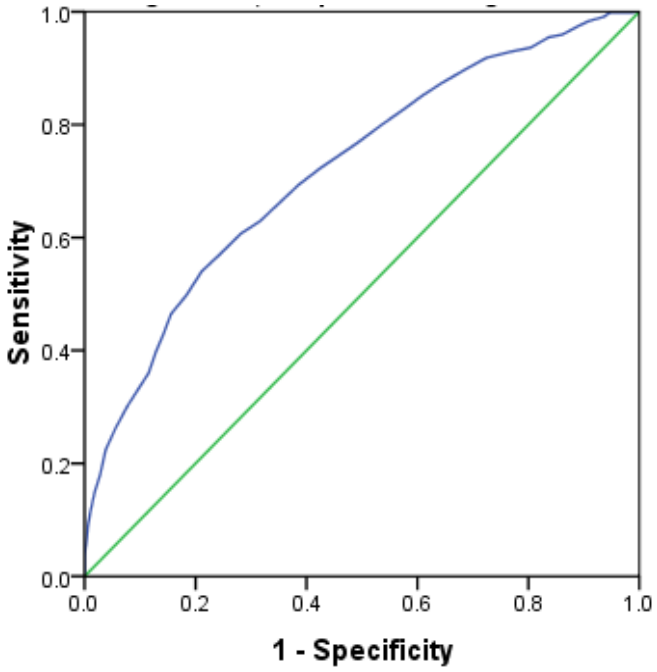


Figure I 6. ROC Curve for Black male offenders (AUC= .739).

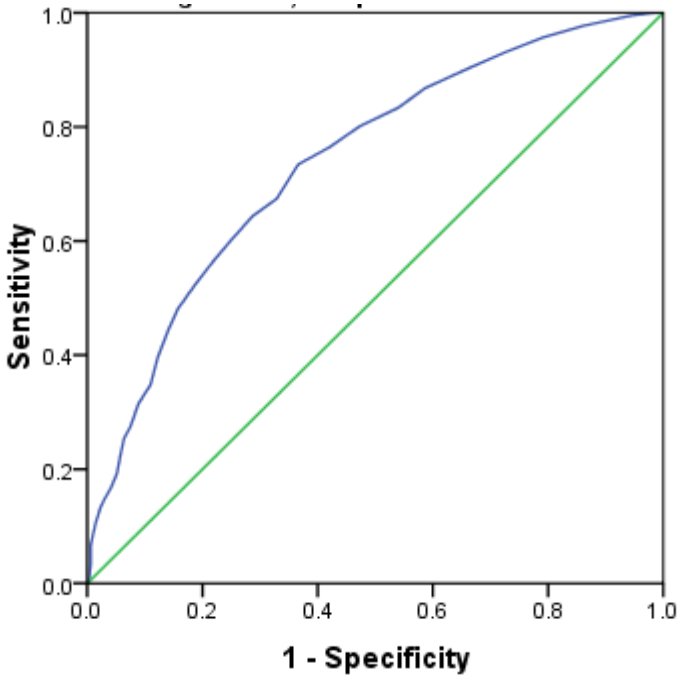


Figure I 7. ROC Curve for Caucasian male offenders (AUC = .738).

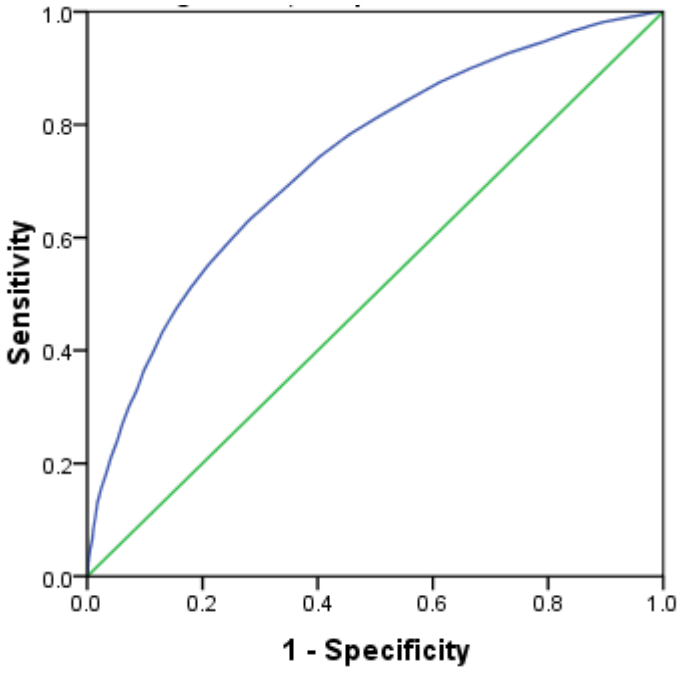


Figure I 8. ROC Curve for Other male offenders (AUC= .717).

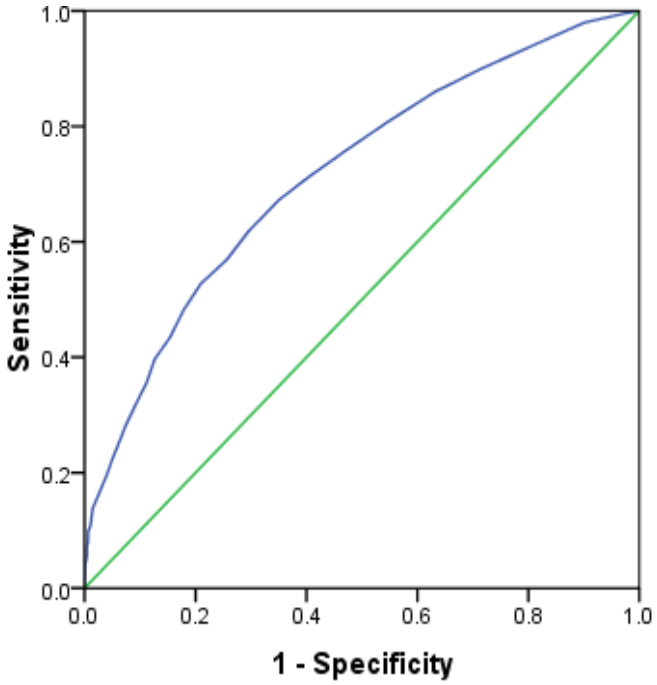
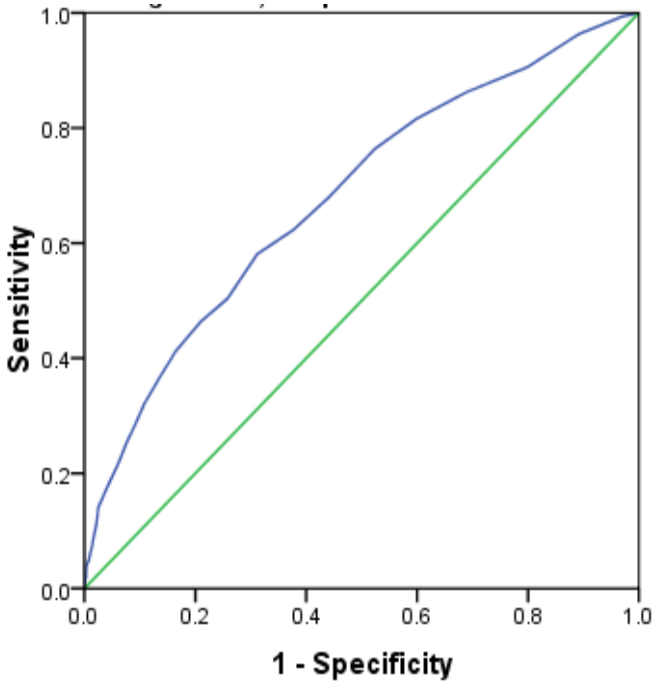


Figure I 9. ROC Curve for Unknown male offenders (AUC = .680).



For the female sample, the number of true predictions was weighed against the number of false predictions using ROC analysis and reported using the AUC. For the raw LSI-OR scores, the AUC = .763 ±.016. Individual disposition groups were also examined: conditional sentence, AUC = .782 ±.038; probation, AUC =.738 ± .019; custodial, AUC =.716 ±.063. All racial groups also displayed a positive AUC: Aboriginal, AUC = .685 ±.051; Black, AUC =.747 ±.062; Caucasian, AUC =.759 ±.020; Other, AUC =.742 ±.072; Unknown, AUC =.685 ±.048.

Figure I 10. ROC Curve for female offenders (AUC= .763).

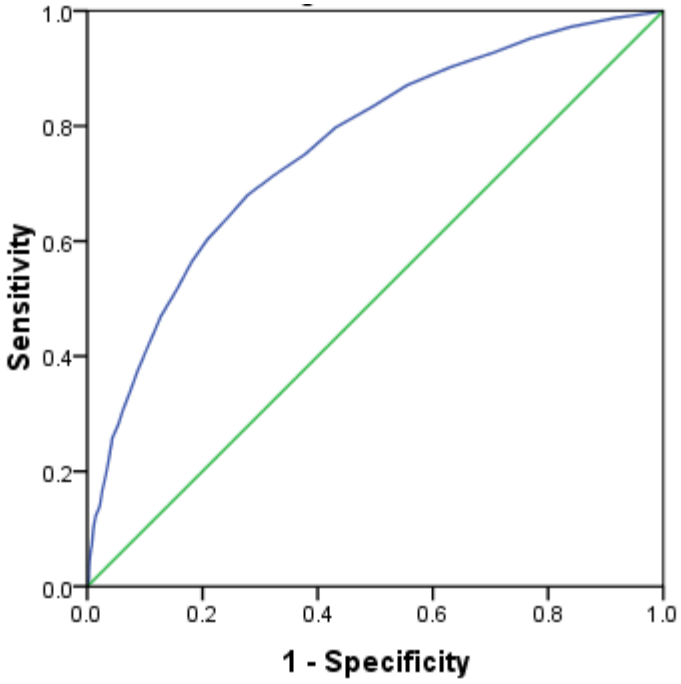


Figure I 11. ROC Curve for female offenders on a conditional sentence (AUC= .782).

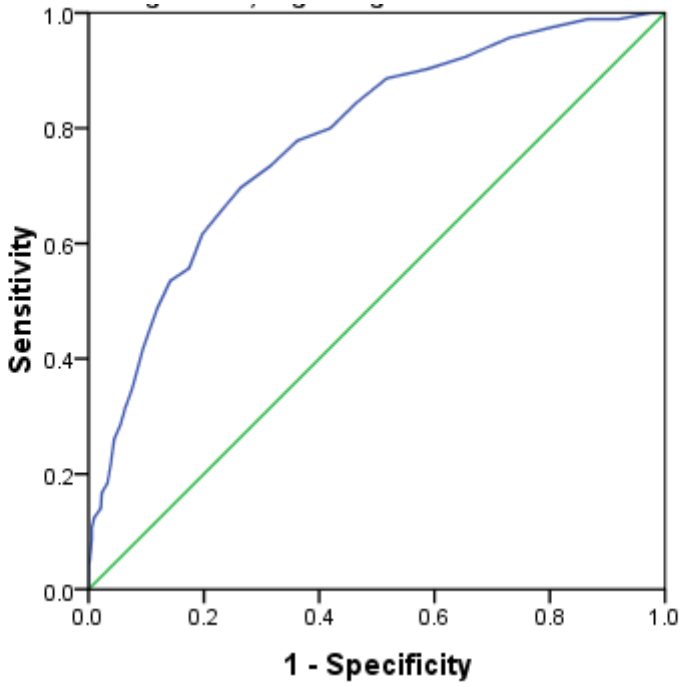


Figure I 12. ROC Curve for female offenders on probation (AUC= .738).

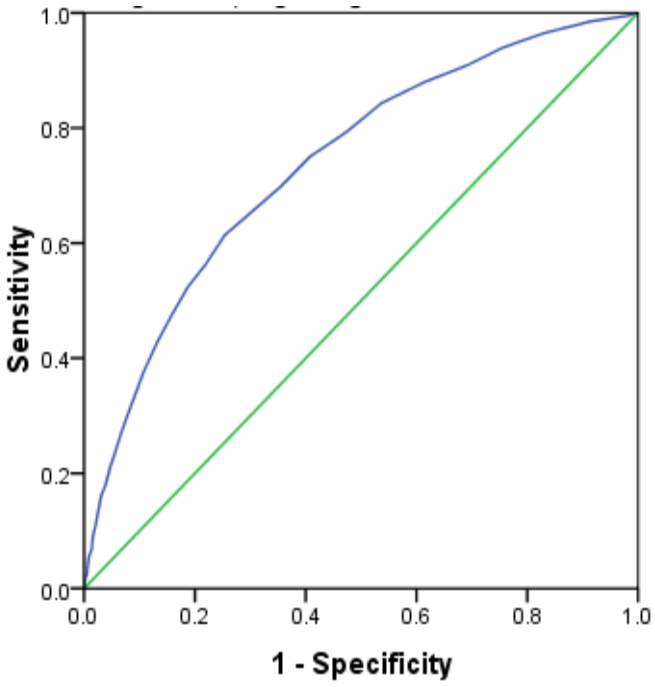


Figure I 13. ROC Curve for female offenders from custody (AUC= .716).

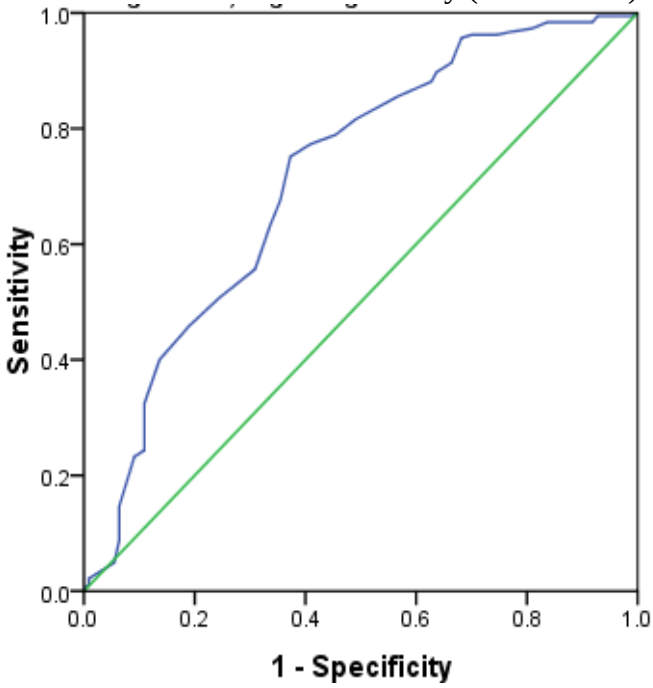


Figure I 14. ROC Curve for Aboriginal female offenders (AUC = .685).

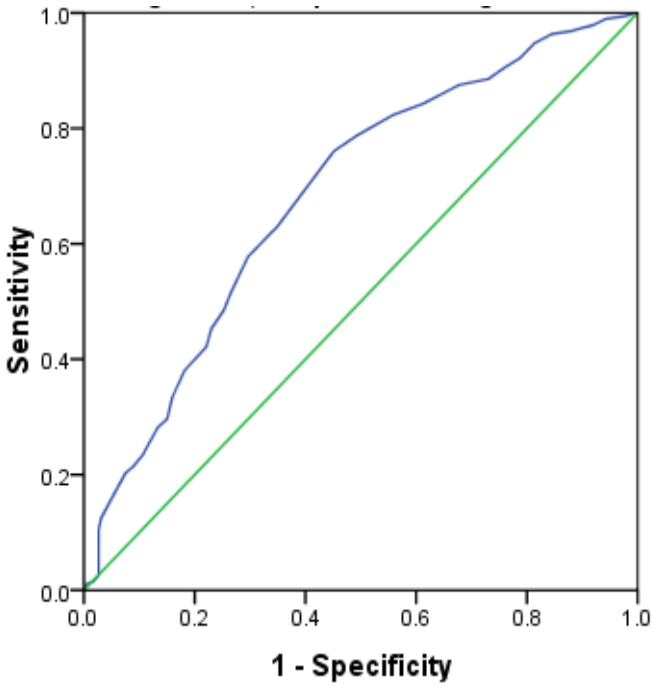


Figure I 15. ROC Curve for Black female offenders (AUC= .747).

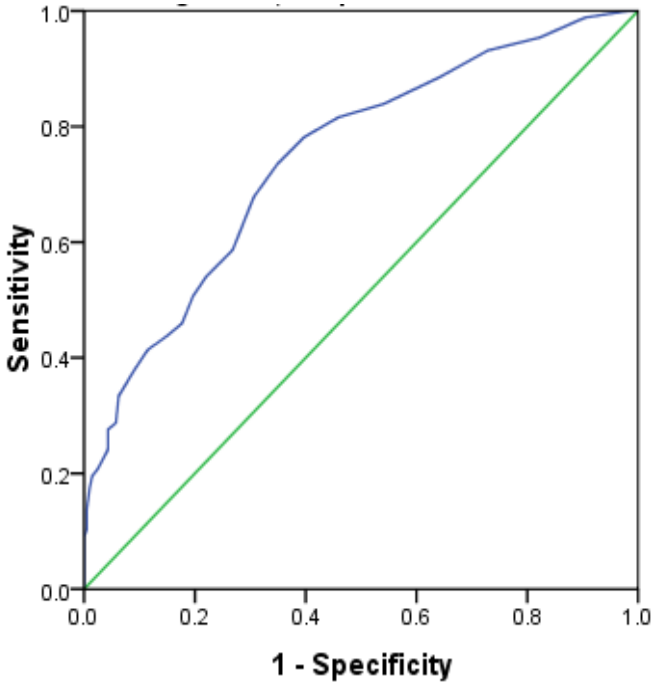


Figure I 16. ROC Curve for Caucasian female offenders (AUC= .759).

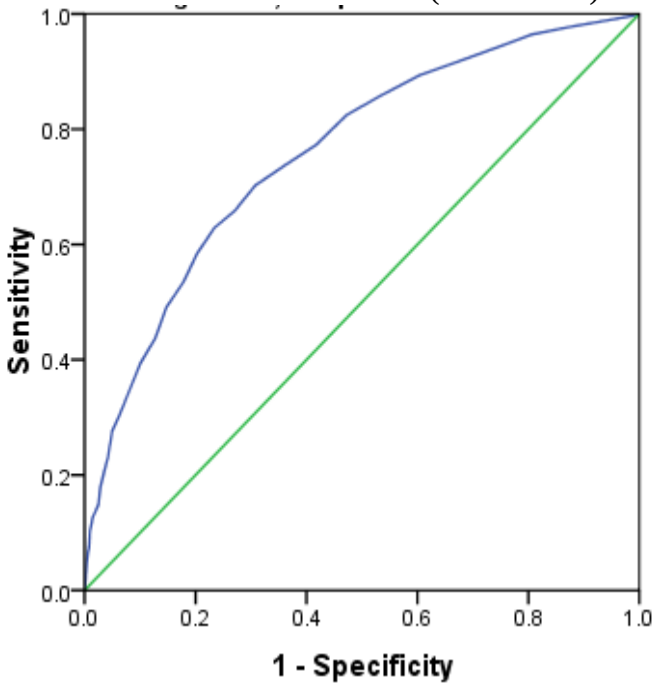


Figure I 17. ROC Curve for Other female offenders (AUC= .742).

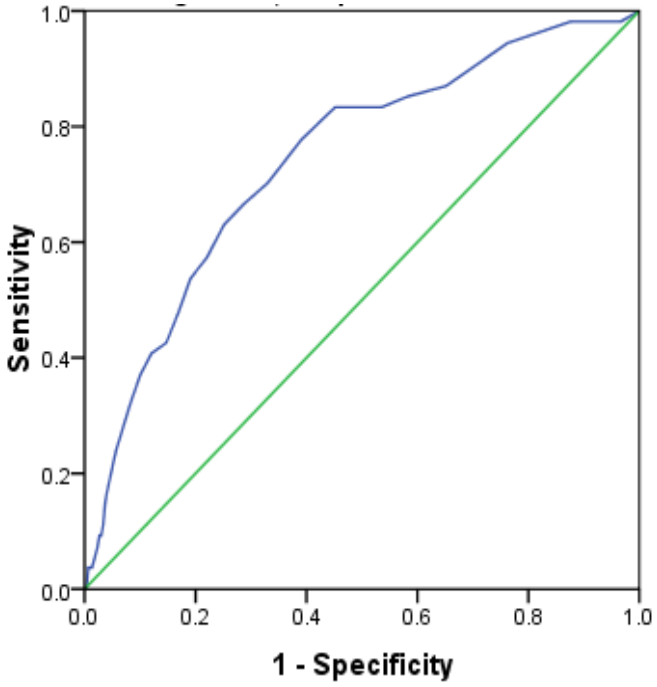
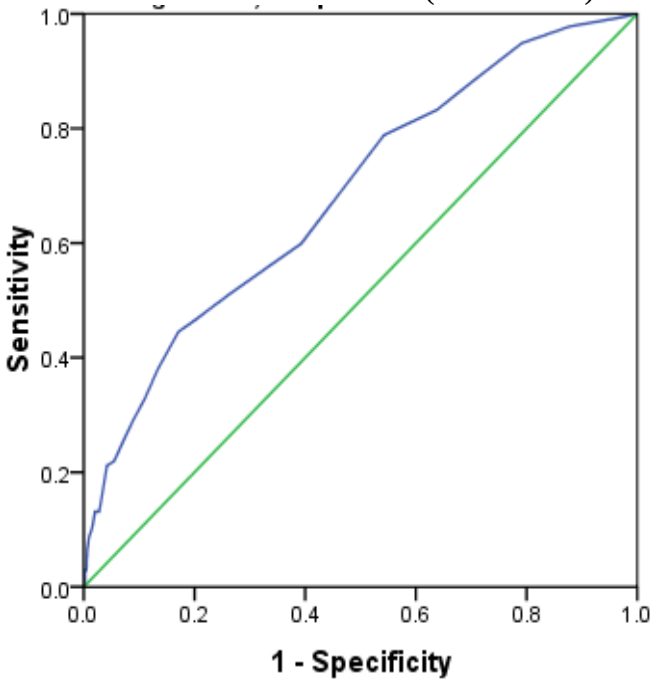


Figure I 18. ROC Curve for Unknown female offenders (AUC= .685).



Appendix J

Table J 1. Change in number of offenders from original to override risk level for males

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	4220 (19.5%)	0	0	0	3093	136	841	139	11	3103 (14.4%)
2	6173 (28.6%)	0	0	5	4374	1501	271	22	0	4574 (21.2%)
3	6506 (30.1%)	0	4	59	5929	481	33	0	0	8529 (39.5%)
4	3433 (15.9%)	1	4	152	3228	48	0	0	0	4142 (19.2%)
5	1284 (5.9%)	1	106	23	1154	0	0	0	0	1268 (5.9%)
	21616 (100%)	2	114	239	17778	2166	1145	161	11	21616 (100%)

Table J 2. Change in number of offenders from original to override risk level for females

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	1131 (23.4%)	0	0	0	990	30	107	4	0	995 (20.6%)
2	1624 (33.6%)	0	0	5	1336	259	23	1	0	1388 (28.7%)
3	1386 (28.7%)	0	0	22	1331	33	0	0	0	1733 (35.9%)
4	566 (11.7%)	0	0	27	535	4	0	0	0	596 (12.3%)
5	127 (2.6%)	0	9	1	117	0	0	0	0	122 (2.5%)
	4834 (100%)	0	9	55	4309	326	130	5	0	4834 (100%)

Table J 3. Change in number of offenders from original to override risk level for Aboriginal clients

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	72 (4.3%)	0	0	0	60	2	10	0	0	61 (3.6%)
2	197 (11.6%)	0	0	0	159	28	9	1	0	169 (10.0%)
3	542 (32.0%)	0	0	8	499	33	2	0	0	593 (35%)
4	503 (29.7%)	1	0	27	468	7	0	0	0	510 (30.1%)
5	378 (22.3%)	0	29	0	378	0	0	0	0	359 (21.2%)
	1692 (100%)	1	29	35	1535	70	21	1	0	1692 (100%)

Table J 4. Change in number of offenders from original to override risk level for Black clients

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	371 (19.3%)	0	0	0	271	15	79	6	0	272 (14.2%)
2	557 (29.0%)	0	0	0	381	158	17	1	0	398 (20.8%)
3	591 (30.8%)	0	1	2	540	48	0	0	0	794 (41.4%)
4	323 (16.8%)	0	0	14	305	4	0	0	0	377 (19.7%)
5	76 (4.0%)	0	3	1	72	0	0	0	0	77 (4.0%)
	1918 (100%)	0	4	17	1569	225	96	7	0	1918 (100%)

Table J 5. Change in number of offenders from original to override risk level for Caucasian clients

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	2419 (15.5%)	0	0	0	1907	66	372	70	4	1913 (12.2%)
2	4338 (27.7%)	0	0	4	3232	914	175	13	0	3359 (21.5%)
3	5192 (33.2%)	0	2	56	4767	345	22	0	0	6250 (39.9%)
4	2802 (17.9%)	0	4	121	2645	32	0	0	0	3258 (20.8%)
5	895 (5.7%)	1	76	23	795	0	0	0	0	866 (5.5%)
	15646 (100%)	1	82	204	13346	1357	569	83	4	15646 (100%)

Table J 6. Change in number of offenders from original to override risk level for Other clients

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	851 (31.6%)	0	0	0	595	38	200	14	4	598 (22.2%)
2	931 (34.5%)	0	0	3	626	272	27	3	0	669 (24.8%)
3	664 (24.6%)	0	0	5	613	42	4	0	0	1097 (40.7%)
4	208 (7.7%)	0	0	8	193	7	0	0	0	276 (10.2%)
5	43 (1.6%)	0	4	0	43	0	0	0	0	57 (2.1%)
	2697 (100%)	0	4	16	2066	359	231	17	4	2697 (100%)

Table J 7. Change in number of offenders from original to override risk level for Unknown clients

Risk Level	Starting N	-3	-2	-1	No Change	+1	+2	+3	+4	Ending N
1	1638 (36.4%)	0	0	0	1250	45	287	53	3	1254 (27.9%)
2	1774 (39.4%)	0	0	3	1312	388	66	5	0	1367 (30.4%)
3	903 (20.1%)	0	1	10	841	46	5	0	0	1528 (34.0%)
4	163 (3.6%)	0	0	9	152	2	0	0	0	317 (7.0%)
5	19 (0.4%)	0	3	0	16	0	0	0	0	31 (0.7%)
	4497 (100%)	0	4	22	3571	481	358	58	3	4497 (100%)

Appendix K

Table K 1. Reoffence rates of original and over-ride risk levels for males

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	4220	514 (12.2%)	3103	398 (12.8%)
Low	6173	1396 (22.6%)	4574	1045 (22.8%)
Medium	6506	2673 (41.1%)	8529	3026 (35.5%)
High	3433	2192 (63.9%)	4142	2363 (57.0%)
Very High	1284	1068 (83.2%)	1268	1011 (79.7%)
Total	21616	7843 (36.28%)	21616	7843 (36.28%)

Table K 2. Reoffence rates of original and over-ride risk levels for females

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	1131	95 (8.4%)	995	82 (8.2%)
Low	1624	280 (17.2%)	1388	237 (17.1%)
Medium	1386	500 (36.1%)	1733	559 (32.3%)
High	566	340 (60.1%)	596	342 (57.4%)
Very High	127	98 (77.2%)	122	93 (76.2%)
Total	4834	1313 (27.16%)	4834	1313 (27.16%)

Table K 3. Reoffence rates of original and over-ride risk levels for Aboriginal clients

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	72	13 (18.1%)	61	11 (18.0%)
Low	197	66 (33.5%)	169	55 (32.5%)
Medium	542	256 (47.2%)	593	282 (47.6%)
High	503	321 (63.8%)	510	322 (63.1%)
Very High	378	309 (81.7%)	359	295 (82.2%)
Total	1692	965 (57.03%)	1692	965 (57.03%)

Table K 4. Reoffence rates of original and over-ride risk levels for Black clients

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	371	65 (17.5%)	272	52 (19.1%)
Low	557	180 (32.3%)	398	118 (29.6%)
Medium	591	330 (55.8%)	794	387 (48.7%)
High	323	230 (71.2%)	377	249 (66.0%)
Very High	76	68 (89.5%)	77	67 (87.0%)
Total	1918	873 (45.52%)	1918	873 (45.52%)

Table K 5. Reoffence rates of original and over-ride risk levels for Caucasian clients

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	2419	325 (13.4%)	1913	259 (13.5%)
Low	4338	1020 (23.5%)	3359	797 (23.7%)
Medium	5192	2145 (41.3%)	6250	2369 (37.9%)
High	2802	1791 (63.9%)	3258	1904 (58.4%)
Very High	895	743 (83.0%)	866	695 (80.3%)
Total	15646	6024 (38.50%)	15646	6024 (38.50%)

Table K 6. Reoffence rates of original and over-ride risk levels for Other clients

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	851	99 (11.6%)	598	73 (12.2%)
Low	931	199 (21.4%)	669	147 (22.0%)
Medium	664	249 (37.5%)	1097	307 (28.0%)
High	208	119 (57.2%)	276	137 (49.6%)
Very High	43	35 (81.4%)	57	37 (64.9%)
Total	2697	701 (25.99%)	2697	701 (25.99%)

Table K 7. Reoffence rates of original and over-ride risk levels for Unknown clients

	Original Risk Level		Over-Ride Risk Level	
	Overall N	**Re-offence Rate**	**Overall N**	**Re-offence Rate**
Very Low	1638	107 (6.5%)	1254	85 (6.8%)
Low	1774	211 (11.9%)	1367	165 (12.1%)
Medium	903	193 (21.4%)	1528	240 (15.7%)
High	163	71 (43.6%)	317	93 (29.3%)
Very High	19	11 (57.9%)	31	10 (32.3%)
Total	4497	593 (13.19%)	4497	593 (13.19%)

Appendix L

Table L 1. Pearson correlation for original and override risk levels for males

	Entire Sample (n=21616)	**Custodial (n=4655)**	**Conditional (n=2518)**	**Probation (n=14443)**
Correlation (r)				
Original	.424***	.375***	.384***	.317***
Override	.358***	.335***	.278***	.251***
Area Under Curve				
Original	.743 (.736 - .749)	.710 (.695 - .725)	.731 (.709 - .752)	.689 (.680 - .698)
Override	.704 (.697 - .711)	.686 (.670 - .701)	.666 (.643 - .689)	.649 (.640 - .659)

Table L 2. Pearson correlation for original and override risk levels for females

	Entire Sample (n=4834)	**Custodial (n=295)**	**Conditional (n=707)**	**Probation (n=3832)**
Correlation (r)				
Original	.400***	.386***	.424***	.343***
Override	.369***	.334***	.374***	.321***
Area Under Curve				
Original	.742 (.727 - .758)	.710 (.649 - .772)	.760 (.721 - .800)	.715 (.696 - .734)
Override	.724 (.708 - .740)	.682 (.618 - .745)	.727 (.686 - .768)	.702 (.683 - .721)

Table L 3. Pearson correlation for original and override risk levels for females

	Aboriginal (n=418)	**Black (n=296)**	**Caucasian (n=2695)**	**Other (n=353)**	**Unknown (n=1072)**
Correlation (r)					
Original	.297***	.376***	.405***	.297***	.227***
Override	.304***	.386***	.377***	.240***	.182***
Area Under Curve					
Original	.663(.611-.715)	.716(.651-.781)	.738(.718-.758)	.719(.644-.795)	.669(.618-.719)
Override	.668(.616-.719)	.729(.667-.792)	.721 (.701-.742)	.681(.606-.756)	.640(.590-.690)

Table L 4. Pearson correlation for original and override risk levels for males

	Aboriginal (n=1274)	**Black (n=1622)**	**Caucasian (n=12951)**	**Other (n=2344)**	**Unknown (n=3425)**
Correlation (r)					
Original	.352***	.402***	.396***	.340***	.237***
Override	.335***	.326***	.341***	.246***	.159***
Area Under Curve					
Original	.698(.669-.728)	.725(.700-.749)	.724(.715-.733)	.699(.675-.723)	.671(.644-.698)
Override	.687(.658-.717)	.679(.653-.704)	.691(.682-.700)	.645(.620-.670)	.625(.597-.652)

Appendix M – Males

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-4; Low, 5-8, Medium, 9-13; High, 14-20; Very High, 21-43. These were the exact same Coulson risk levels as produced in the total sample.

Table M 1. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-4	4220	19.5%	514	12.2%
Low	5-8	4268	19.7%	881	20.6%
Medium	9-13	4521	20.9%	1428	31.6%
High	14-20	4349	20.1%	2029	46.7%
Very High	21-43	4258	19.7%	2991	70.2%
Total	0-43	21616	100%	7843	36.3%

Table M 2. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	525	39(7.4%)	3628	463(12.8%)	67	12(17.9%)
Low	528	82(15.5%)	3539	752(21.2%)	201	47(23.4%)
Medium	624	166(26.6%)	3421	1091(31.9%)	476	171(35.9%)
High	520	217(41.7%)	2707	1240(45.8%)	1122	572(51.0%)
Very High	321	199(62.0%)	1148	698(60.8%)	2789	2089(75.1%)
Total	2518	703(27.9%)	14443	4244(29.4%)	4655	2891(62.1%)

Table M 3. Offenders and re-offenders by Coulson-type risk levels and disposition

	Aboriginal		Black		Caucasian		Other		Unknown	
	All N	Reoffenders N(%)	All N	Reoffenders N(%)	All N	Reoffenders N(%)	All N	Reoffenders N(%)	All N	Reoffenders N(%)
Very Low	39	7(17.9%)	286	55(19.2%)	1901	277(14.6%)	718	91(12.7%)	1276	84(6.6%)
Low	78	28(35.9%)	310	101(32.6%)	2325	524(22.5%)	597	121(20.3%)	958	107(11.2%)
Medium	160	63(39.4%)	344	157(45.6%)	2809	936(33.3%)	487	154(31.6%)	721	118(16.4%)
High	307	162(52.8%)	361	226(62.6%)	2979	1391(46.7%)	347	154(44.4%)	355	96(27.0%)
Very High	690	513(74.3%)	321	247(76.9%)	2937	2053(69.9%)	195	127(65.1%)	115	51(44.3%)
Total	1274	773(60.7%)	1622	786(48.5%)	12951	5181(40.0%)	2344	647(27.6%)	3425	456(13.3%)

Table M 4. Correlation and AUC for original Coulson and male Coulson by disposition

	Entire Sample (n=21616)	Custodial (n=4655)	Conditional (n=2518)	Probation (n=14443)
Correlation (r)				
Original Coulson	.415***	.347***	.384***	.320***
Male Coulson	.415***	.347***	.384***	.320***
Area Under Curve				
Original Coulson	.744 (.737 - .751)	.682 (.666 - .699)	.740 (.719 - .761)	.695 (.685 - .704)
Male Coulson	.744 (.737 - .751)	.682 (.666 - .699)	.740 (.719 - .761)	.695 (.685 - .704)

Table M 5. Pearson correlation for original Coulson and male Coulson risk levels

	Aboriginal (n=1274)	**Black (n=1622)**	**Caucasian (n=12951)**	**Other (n=2344)**	**Unknown (n=3425)**
Correlation (r)					
Original Coulson	.326***	.403***	.385***	.343***	.237***
Male Coulson	.326***	.403***	.385***	.343***	.237***
Area Under Curve					
Original Coulson	.677(.647-.708)	.728(.703-.752)	.724(.715-.733)	.707(.683-.731)	.677(.649-.704)
Male Coulson	.677(.647-.708)	.728(.703-.752)	.724(.715-.733)	.707(.683-.731)	.677(.649-.704)

Appendix M – Females

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-3; Low, 4-7, Medium, 8-11; High, 12-17; Very High, 18-43.

Table M 6. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-3	877	18.1%	63	7.2%
Low	4-7	1128	23.3%	157	13.9%
Medium	8-11	955	19.8%	200	20.9%
High	12-17	940	19.4%	338	36.0%
Very High	18-43	934	19.3%	555	59.4%
Total	0-43	4834	100.0%	1313	27.2%

Table M 7. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N(%)	**Reoffenders N(%)**	**All N(%)**	**Reoffenders N(%)**	**All N(%)**	**Reoffenders N(%)**
Very Low	112	5(4.5%)	763	57(7.5%)	2	1(50.0%)
Low	161	16(9.9%)	957	139(14.5%)	10	2(20.0%)
Medium	133	28(21.1%)	799	168(21.0%)	23	4(17.4%)
High	149	46(30.9%)	763	277(36.3%)	28	15(53.6%)
Very High	152	90(59.2%)	550	302(54.9%)	232	163(70.3%)
Total	707	185(26.2%)	3832	943(24.6%)	295	185(62.7%)

Table M 8. Offenders and re-offenders by Coulson-type risk levels and disposition

	Aboriginal		Black		Caucasian		Other		Unknown	
	All N	Reoff. N(%)	All N	Reoff. N(%)	All N	Reoff. N(%)	All N	Reoff. N(%)	All N	Reoff. N(%)
Very Low	22	4(18.2%)	63	6(9.5%)	388	30(7.7%)	111	7(6.3%)	293	16(5.5%)
Low	41	11(26.8%)	82	13(15.9%)	592	89(15.0%)	83	5(6.0%)	330	39(11.8%)
Medium	54	15(27.8%)	58	21(36.2%)	553	132(23.9%)	62	11(17.7%)	228	21(9.2%)
High	123	51(41.5%)	51	18(35.3%)	557	223(40.0%)	56	14(25.0%)	153	32(20.9%)
Very High	178	111(62.4%)	42	29(69.0%)	605	369(61.0%)	41	17(41.5%)	68	29(42.6%)
Total	418	192(45.9%)	296	87(29.4%)	2695	843(31.3%)	353	54(15.3%)	1072	137(12.8%)

Table M 9. Correlation and AUC for original Coulson and female Coulson by disposition

	Entire Sample (n=4834)	Custodial (n=295)	Conditional (n=707)	Probation (n=3832)
Correlation (r)				
Original Coulson	.406***	.394***	.425***	.357***
Female Coulson	.397***	.317***	.423***	.353***
Area Under Curve				
Original Coulson	.751(.735-.766)	.634(.566-.703)	.773(.735-.811)	.728(.710-.747)
Female Coulson	.752 (.737 - .768)	.689 (.623 - .755)	.770 (.731 - .809)	.727 (.708 - .745)

Table M 10. Pearson correlation for original Coulson and female Coulson risk levels

	Aboriginal (n=418)	**Black (n=296)**	**Caucasian (n=2695)**	**Other (n=353)**	**Unknown (n=1072)**
Correlation (r)					
Original Coulson	.303***	.383***	.415***	.302***	.227***
Female Coulson	.294***	.400***	.401***	.312***	.230***
Area Under Curve					
Original Coulson	.672(.620-.723)	.730(.666-.793)	.751(.731-.771)	.722(.647-.797)	.666(.615-.716)
Female Coulson	.670(.618-.721)	.742(.680-.804)	.746(.726-.765)	.731(.655-.806)	.672(.622-.722)

Appendix M – Aboriginal

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-11; Low, 12-17, Medium, 18-23; High, 24-30; Very High, 31-43.

Table M 11. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-11	318	18.8%	93	29.2%
Low	12-17	359	21.2%	169	47.1%
Medium	18-23	350	20.7%	197	56.3%
High	24-30	361	21.3%	248	68.7%
Very High	31-43	304	18.0%	258	84.9%
Total	0-43	1692	100%	965	57.0%

Table M 12. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	Total N	**Recidivism N(%)**	**Total N**	**Recidivism N(%)**	**Total N**	**Recidivism N(%)**
Very Low	41	14(34.1%)	260	76(29.2%)	17	3(17.6%)
Low	50	18(36.0%)	274	132(48.2%)	35	19(54.3%)
Medium	50	28(56.0%)	208	113(54.3%)	92	56(60.9%)
High	41	21(51.2%)	117	73(62.4%)	203	154(75.9%)
Very High	16	15(93.8%)	32	25(78.1%)	256	218(85.2%)
Total	198	96(48.5%)	891	419(47.0%)	603	450(74.6%)

Table M 13. Offenders and re-offenders by Coulson-type risk levels and gender

	Male		**Female**	
	All N(%)	**Reoffenders N(%)**	**All N(%)**	**Reoffenders N(%)**
Very Low	201	63(31.3%)	117	30(25.6%)
Low	236	118(50.0%)	123	51(41.5%)
Medium	272	150(55.1%)	78	47(60.3%)
High	292	208(71.2%)	69	40(58.0%)
Very High	273	234(85.7%)	31	24(77.4%)
Total	1274	773(60.7%)	418	192(45.9%)

Table M 14. Correlation and AUC for original Coulson and Aboriginal Coulson by disposition

	Entire Sample (n=1692)	**Custodial (n=603)**	**Conditional (n=198)**	**Probation (n=891)**
Correlation (r)				
Original Coulson	.335***	.276***	.241***	.252***
Aboriginal Coulson	.368***	.307***	.275***	.253***
Area Under Curve				
Original Coulson	.684 (.658 - .710)	.601(.546-.657)	.638(.561-.715)	.639(.603-.675)
Aboriginal Coulson	.710(.685-.734)	.672(.621-.723)	.649(.573-.725)	.642(.606-.678)

Table M 15. Pearson correlation for original Coulson and Aboriginal Coulson risk levels for males

	Entire Sample (n=1274)	**Custodial (n=559)**	**Conditional (n=132)**	**Probation (n=583)**
Correlation (r)				
Original Coulson	.326***	.284***	.191*	.241***
Aboriginal Coulson	.364***	.318***	.260*	.241***
Area Under Curve				
Original Coulson	.677 (.647 - .708)	.608(.550-.666)	.607(.511-.704)*	.632(.587-.677)
Aboriginal Coulson	.711(.682-.739)	.681(.628-.734)	.638(.544-.732)	.633(.588-.678)

Table M 16. Pearson correlation for original Coulson and Aboriginal Coulson risk levels for females

	Entire Sample (n=418)	**Custodial (n=44)**	**Conditional (n=66)**	**Probation (n=308)**
Correlation (r)				
Original Coulson	.303***	.202	.334**	.263***
Aboriginal Coulson	.308***	.200	.308*	.266***
Area Under Curve				
Original Coulson	.672 (.620 - .723)	.540(.351-.730)*n.s.*	.697(.568-.827)*	.650(.589-.712)
Aboriginal Coulson	.675(.624-.727)	.589(.405-.774)*n.s.*	.668(.535-.800)*	.654(.592-.715)

Appendix M – Black

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-4; Low, 5-8, Medium, 9-13; High, 14-19; Very High, 21-43.

Table M 17. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-4	371	19.3%	65	17.5%
Low	5-8	384	20.0%	114	29.7%
Medium	9-13	404	21.1%	181	44.8%
High	14-19	360	18.8%	215	59.7%
Very High	21-43	399	20.8%	298	74.7%
Total	0-43	1918	100.0%	873	45.5%

Table M 18. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	45	4(8.9%)	322	60(18.6%)	4	1(25.0%)
Low	54	17(31.5%)	302	87(28.8%)	28	10(35.7%)
Medium	67	24(35.8%)	274	127(46.4%)	63	30(47.6%)
High	56	36(64.3%)	198	112(56.6%)	106	67(63.2%)
Very High	39	31(79.5%)	111	73(65.8%)	249	194 (77.9%)
Total	261	112(42.9%)	1207	459(38.0%)	450	302(67.1%)

Table M 19. Offenders and re-offenders by Coulson-type risk levels and gender

	Male		**Female**	
	All N(%)	**Reoffenders N(%)**	**All N(%)**	**Reoffenders N(%)**
Very Low	286	55(19.2%)	85	10(11.8%)
Low	310	101(32.6%)	74	13(17.6%)
Medium	344	157(45.6%)	60	24(40.0%)
High	316	199(63.0%)	44	16(36.4%)
Very High	366	274(74.9%)	33	24(72.7%)
Total	1622	786(48.5%)	296	87(29.4%)

Table M 20. Correlation and AUC for original Coulson and Black Coulson by disposition

	Entire Sample (n=1918)	**Custodial (n=450)**	**Conditional (n=261)**	**Probation (n=1207)**
Correlation (r)				
Original Coulson	.411***	.295***	.459***	.337***
Black Coulson	.410***	.299***	.458***	.333***
Area Under Curve				
Original Coulson	.734 (.711 - .756)	.660(.606-.715)	.761(.703-.819)	.694(.664-.725)
Black Coulson	.733(.710-.755)	.661(.606-.716)	.761(.702-.819)	.693(.662-.723)

Table M 21. Pearson correlation for original Coulson and Black Coulson risk levels for males

	Entire Sample (n=1622)	**Custodial (n=434)**	**Conditional (n=209)**	**Probation (n=979)**
Correlation (r)				
Original Coulson	.403***	.282***	.488***	.337***
Black Coulson	.399***	.284***	.483***	.331***
Area Under Curve				
Original Coulson	.728 (.703 - .752)	.653(.597-.709)	.775(.713-.838)	.692(.658-.725)
Black Coulson	.726(.701-.750)	.652(.596-.708)	.773(.710-.836)	.690(.656-.724)

Table M 22. Pearson correlation for original Coulson and Black Coulson risk levels for females

	Entire Sample (n=296)	**Custodial (n=16)**	**Conditional (n=52)**	**Probation (n=228)**
Correlation (r)				
Original Coulson	.383***	.709***	.332*	.297***
Black Coulson	.390***	.795***	.349*	.297***
Area Under Curve				
Original Coulson	.730 (.666 - .793)	.923(.783-1.063)*	.711(.562-.860)*	.688(.609-.766)
Black Coulson	.733(.669-.796)	.974(.901-1.048)*	.719(.570-.867)*	.688(.609-.766)

Appendix M – Caucasian

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-5; Low, 6-9, Medium, 10-14; High, 15-21; Very High, 22-43.

Table M 23. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-5	3159	20.2%	452	14.3%
Low	6-9	2900	18.5%	698	24.1%
Medium	10-14	3305	21.1%	1128	34.1%
High	15-21	3279	21.0%	1613	49.2%
Very High	22-43	3003	19.2%	2133	71.0%
Total	0-43	15646	100%	6024	38.5%

Table M 24. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	377	27(7.2%)	2722	415 (15.2%)	60	10 (16.7%)
Low	344	58(16.9%)	2425	608 (25.1%)	131	32 (24.4%)
Medium	468	149 (31.8%)	2492	846 (33.9%)	345	133(38.6%)
High	383	152 (39.7%)	2024	987 (48.8%)	872	474 (54.4%)
Very High	224	141(62.9%)	846	542 (64.1%)	1933	1450 (75.0%)
Total	1796	527(29.34%)	10509	3398(32.3%)	3341	2099(62.8%)

Table M 25. Offenders and re-offenders by Coulson-type risk levels and gender

	Male		**Female**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	2489	383 (15.4%)	670	69(10.3%)
Low	2301	576 (25.0%)	599	122 (20.4%)
Medium	2748	969 (35.3%)	557	159 (28.5%)
High	2768	1369 (49.5%)	511	244 (47.7%)
Very High	2645	1884 (71.2%)	358	249 (69.6%)
Total	12951	5181(40.0%)	2695	843(31.3%)

Table M 26. Correlation and AUC for original Coulson and Caucasian Coulson by disposition

	Entire Sample (n=15646)	**Custodial (n=3341)**	**Conditional (n=1796)**	**Probation (n=10509)**
Correlation (r)				
Original Coulson	.393***	.322***	.373***	.313***
Caucasian Coulson	.398***	.332***	.373***	.315***
Area Under Curve				
Original Coulson	.730 (.722 - .738)	.667(.647-.686)	.732(.707-.757)	.687(.676-.697)
Caucasian Coulson	.732(.724-.740)	.673 (.653-.692)	.729 (.704 -.754)	.687 (.676-.698)

Table M 27. Pearson correlation for original Coulson and Caucasian Coulson risk levels for males

	Entire Sample (n=12951)	**Custodial (n=3140)**	**Conditional (n=1415)**	**Probation (n=8396)**
Correlation (r)				
Original Coulson	.385***	.315***	.358***	.299***
Caucasian Coulson	.391***	.324***	.358***	.304***
Area Under Curve				
Original Coulson	.724 (.715 - .733)	.664(.644-.684)	.721(.693-.750)	.677(.665-.689)
Caucasian Coulson	.727(.718-.735)	.669 (.649-.689)	.719(.691-.747)	.679(.667-.691)

Table M 28. Pearson correlation for original Coulson and Caucasian Coulson risk levels for females

	Entire Sample (n=2695)	**Custodial (n=201)**	**Conditional (n=381)**	**Probation (n=2113)**
Correlation (r)				
Original Coulson	.415***	.417***	.429***	.368***
Caucasian Coulson	.413***	.437***	.427***	.362***
Area Under Curve				
Original Coulson	.751 (.731 - .771)	.703(.624-.783)	.771(.720-.821)	.726(.702-.750)
Caucasian Coulson	.747(.727-.767)	.723 (.646-.801)	.768 (.716-.819)	.720 (.695-.744)

Appendix M – Aboriginal Male

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-12; Low, 13-18, Medium, 19-24; High, 25-30; Very High, 31-43.

Table M 29. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-12	234	18.4%	78	33.3%
Low	13-18	268	21.0%	136	50.7%
Medium	19-24	248	19.5%	141	56.9%
High	25-30	251	19.7%	184	73.3%
Very High	31-43	273	21.4%	234	85.7%
Total	0-43	1274	100.0%	773	60.7%

Table M 30. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	30	10(33.3%)	184	62(33.7%)	20	6(30.0%)
Low	36	15(41.7%)	192	98(51.0%)	40	23(57.5%)
Medium	32	16(50.0%)	120	68(56.7%)	96	57(59.4%)
High	21	11(52.4%)	63	42(66.7%)	167	131(78.4%)
Very High	13	12(92.3%)	24	19(79.2%)	236	203(86.0%)
Total	132	64(48.5%)	583	289(49.6%)	559	420(75.1%)

Table M 31. Correlation and AUC for original Coulson and Aboriginal male Coulson by disposition

	Entire Sample (n=1274)	**Custodial (n=559)**	**Conditional (n=132)**	**Probation (n=583)**
Correlation (r)				
Original Coulson	.326***	.284***	.191*	.241***
Ab. Male Coulson	.367***	.310***	.285***	.245***
Area Under Curve				
Original Coulson	.677 (.647 - .708)	.608(.550-.666)	.607(.511-.704)*	.632(.587-.677)
Ab. Male Coulson	.713(.684-.741)	.682(.629-.735)	.651(.558-.744)**	.636(.591-.681)

Appendix M – Aboriginal Female

A second set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-9; Low, 10-14, Medium, 15-18; High, 19-25; Very High, 26-43.

Table M 32. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-9	83	19.9%	22	26.5%
Low	10-14	87	20.8%	24	27.6%
Medium	15-18	89	21.3%	47	52.8%
High	19-25	75	17.9%	45	60.0%
Very High	26-43	84	20.1%	54	64.3%
Total	0-43	418	100.0%	192	45.9%

Table M 33. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	13	5(38.5%)	69	17(24.6%)	1	0(0%)
Low	14	3(21.4%)	73	21(28.8%)	0	0(0%)
Medium	10	4(40.0%)	77	42(54.5%)	2	1(50.0%)
High	15	10(66.7%)	54	30(55.6%)	6	5(83.2%)
Very High	14	10(71.4%)	35	20(57.1%)	35	24(68.6%)
Total	66	32(48.5%)	308	130(42.2%)	44	30(68.2%)

Table M 34. Correlation and AUC for original Coulson and Aboriginal female Coulson by disposition

	Entire Sample (n=418)	**Custodial (n=44)**	**Conditional (n=66)**	**Probation (n=306)**
Correlation (r)				
Original Coulson	.303***	.202	.334**	.263***
Ab. Female Coulson	.305***	.163	.327**	.262***
Area Under Curve				
Original Coulson	.672 (.620 - .723)	.540(.351-.730)*n.s.*	.697(.568-.827)*	.650(.589-.712)
Ab. Female Coulson	.674(.622-.726)	.519(.329-.709)n.s.	.683(.551-.815)	.654(.592-.715)

Appendix M - Black Male

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-4; Low, 5-9, Medium, 10-14; High, 15-20; Very High, 21-43.

Table M 35. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-4	286	17.6%	55	19.2%
Low	5-9	386	23.8%	131	33.9%
Medium	10-14	321	19.8%	155	48.3%
High	15-20	308	19.0%	198	64.3%
Very High	21-43	321	19.8%	247	76.9%
Total	0-43	1622	100.0%	786	48.5%

Table M 36. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	38	3(7.9%)	244	51(20.9%)	4	1(25.0%)
Low	51	20(39.2%)	298	94(31.5%)	37	17(45.9%)
Medium	55	22(40.0%)	205	104(50.7%)	61	29(47.5%)
High	37	26(70.3%)	151	94(62.3%)	120	78(65.0%)
Very High	28	25(89.3%)	81	58(71.6%)	212	164(77.4%)
Total	209	96(45.9%)	979	401(41.0%)	434	289(66.6%)

Table M 37. Correlation and AUC for original Coulson and Black male Coulson by disposition

	Entire Sample (n=1622)	**Custodial (n=434)**	**Conditional (n=209)**	**Probation (n=979)**
Correlation (r)				
Original Coulson	.403***	.282***	.488***	.337***
Black Male Coulson	.404***	.263***	.489***	.346***
Area Under Curve				
Original Coulson	.728 (.703 - .752)	.653(.597-.709)	.775(.713-.838)	.692(.658-.725)
Black Male Coulson	.729(.704-.753)	.647(.591-.703)	.773(.710-.835)	.697(.663-.730)

Appendix M – Black Female

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-3; Low, 4-6, Medium, 7-10; High, 11-16; Very High, 17-43.

Table M 38. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-3	63	21.3%	6	9.5%
Low	4-6	66	22.3%	10	15.2%
Medium	7-10	60	20.3%	20	33.3%
High	11-16	55	18.6%	18	32.7%
Very High	17-43	52	17.6%	33	63.5%
Total	0-43	296	100.0%	87	29.4%

Table M 39. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	6	0(0%)	57	6(10.5%)	0	0(0%)
Low	9	2(18.2%)	54	8(14.8%)	1	0(0%)
Medium	7	2(28.6%)	53	18(34.0%)	0	0(0%)
High	14	4(28.6%)	40	14(35.0%)	1	0(0%)
Very High	14	8(57.1%)	24	12(50.0%)	14	13(92.9%)
Total	50	16(32.0%)	228	58(25.4%)	16	13(81.2%)

Table M 40. Correlation and AUC for original Coulson and Black female Coulson by disposition

	Entire Sample (n=296)	**Custodial (n=16)**	**Conditional (n=52)**	**Probation (n=228)**
Correlation (r)				
Original Coulson	.383***	.709***	.332*	.297***
Bl. Female Coulson	.381***	.694**	.369**	.295***
Area Under Curve				
Original Coulson	.730 (.666 - .793)	.923(.783-1.063)*	.711(.562-.860)*	.688(.609-.766)
Bl. Female Coulson	.734(.672-.796)	.833(.496-1.171)n.s.	.729(.585-.873)**	.690(.613-.767)

Appendix M – Caucasian Male

A set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-5; Low, 6-10, Medium, 11-15; High, 16-21; Very High, 22-43.

Table M 41. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-5	2489	19.2%	383	15.4%
Low	6-10	2861	22.1%	740	25.9%
Medium	11-15	2641	20.4%	998	37.8%
High	16-21	2315	17.9%	1176	50.8%
Very High	22-43	2645	20.4%	1884	71.2%
Total	0-43	12951	100.0%	5181	40.0%

Table M 42. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	287	22(7.7%)	2150	352(16.4%)	52	9(17.3%)
Low	332	66(19.9%)	2365	1735(73.4%)	164	44(26.8%)
Medium	378	121(32.0%)	1874	721(38.5%)	389	156(40.1%)
High	244	102(41.8%)	1343	664(49.4%)	728	410(56.3%)
Very High	174	109(62.6%)	664	424(63.9%)	1807	1351(74.8%)
Total	1415	420(29.7%)	8396	3896(46.4%)	3140	1970(62.7%)

Table M 43. Correlation and AUC for original Coulson and Caucasian male Coulson by disposition

	Entire Sample (n=12951)	**Custodial (n=3140)**	**Conditional (n=1415)**	**Probation (n=8396)**
Correlation (r)				
Original Coulson	.385***	.315***	.358***	.299***
Ca. Male Coulson	.395***	.331***	.364***	.305***
Area Under Curve				
Original Coulson	.724 (.715 - .733)	.664(.644-.684)	.721(.693-.750)	.677(.665-.689)
Ca. Male Coulson	.727(.718-.736)	.672(.652-.692)	.721(.693-.750)	.679(.667-.691)

Appendix M – Caucasian Female

A second set of LSI-OR risk levels was developed using the same procedure employed by Coulson and colleagues (1996). Five risk categories were created by dividing the sample into 5 equally proportioned categories. This created the following risk categories: Very Low, 0-4; Low, 5-8, Medium, 9-12; High, 13-18; Very High, 19-43.

Table M 44. Number of offenders and re-offenders in Coulson-type risk levels

Level	**Range**	**Total**	**% Total**	**Total Reoffenders**	**% of Risk Level**
Very Low	0-4	518	19.2%	48	9.3%
Low	5-8	608	22.6%	100	16.4%
Medium	9-12	513	19.0%	140	27.3%
High	13-18	538	20.0%	223	41.4%
Very High	19-43	518	19.2%	332	64.1%
Total	0-43	2695	100%	843	31.28%

Table M 45. Offenders and re-offenders by Coulson-type risk levels and disposition

	Conditional		**Probation**		**Custodial**	
	All N	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**	**All N**	**Reoffenders N(%)**
Very Low	68	3(4.4%)	446	44(9.9%)	4	1(25.0%)
Low	75	8(10.7%)	522	91(17.4%)	11	1(9.1%)
Medium	75	17(22.7%)	427	121(28.3%)	11	2(18.2%)
High	84	31(36.9%)	427	175(41.0%)	27	17(63.0%)
Very High	79	48(60.8%)	291	176(60.5%)	148	108(73.0%)
Total	381	107(28.1%)	2113	607(28.7%)	201	129(64.2%)

Table M 46. Correlation and AUC for original Coulson and Coulson female Coulson by disposition

	Entire Sample (n=2695)	**Custodial (n=201)**	**Conditional (n=381)**	**Probation (n=2113)**
Correlation (r)				
Original	.415***	.417***	.429***	.368***
Coulson	.407***	.376***	.436***	.361***
Area Under Curve				
Original	.751 (.731 - .771)	.703(.624-.783)	.771(.720-.821)	.726(.702-.750)
Coulson	.748(.728-.767)	.659(.575-.742)	.776(.726-.826)	.723(.699-.747)

Appendix N: Subsample

2.1. The Sub-Sample

The sample was comprised of 296 male and female offenders from each race category (Aboriginal, Black, Caucasian, Other and Unknown), for a total of 2960 offenders (50.0% Male and 50.0% Female) from three different types of disposition: custody (N=408[13.8%]: 330 Male[22.3%], 78 [5.3%]Female), probation, (N=2100[70.9%]: 941 Male[63.6%], 1159[78.3%] Female), conditional sentence (N=452[15.3%]: 209 [14.1%]Male, 243[16.4%] Female)

There was a significant association between the disposition of the offender and the race of the offender (χ 2 (8) =157.96, p<.001). The breakdown of disposition by racial group can be found in Table N 1.

Table N 1. Number and percentage of offenders by disposition and racial group

	Conditional	**Probation**	**Custodial**	**Total**
Caucasian	**73** 16.2%*	**433** 20.6%*	**86** 21.1%*	**592** 20.0%*
(Row %)	12.3%	73.1%	14.5%	100%
Aboriginal	**88** 19.5%*	**346** 16.5%*	**158** 38.7%*	**592** 20.0%*
(Row %)	14.9%	58.4%	26.7%	100%
Black	**98** 21.7%*	**406** 19.3%*	**88** 21.6%*	**592** 20.0%*
(Row %)	16.6%	68.6%	14.9%	100%
Other	**106** 23.5%*	**433** 20.6%*	**53** 13.0%*	**592** 20.0%*
(Row %)	17.9%	73.1%	9.0%	100%
Unknown	**87** 19.2%*	**482** 23.0%*	**23** 5.6%*	**592** 20.0%*
(Row %)	14.7%	81.4%	3.9%	100%
Total	**452** 100%*	**2100** 100%*	**408** 100%*	**2960** 100%*
(Row %)	15.3%	70.9%	13.8%	100%

*Column percentages

Client Age at Extraction

The age of these offenders ranged from 22 to 81 years with an average of 36.97 years (SD = 11.04). There was a significant difference age difference between disposition groups, F (2, 2957) = 7.598, p =.001. Since Levene's test was significant (F (2, 2957) = 5.845, p = .003), post hoc analyses using Dunnett's C were examined. The conditional sentence sample (M = 38.76, SD = 10.799) was older than the custody sample (M = 36.12, SD = 9.880; d = 0.255, r = 0.127)

and the probation sample (M = 36.75, SD = 11.264; *d* = 0.182, *r* = 0.091). There was no difference between the age of the custody sample and the probation sample (*d* = -0.059 , *r* = -0.030).

There was also a significant difference in age between racial groups, *F* (4, 2955) = 13.421, *p*<.001. Again, the Levene's test was significant (*F* (4, 2955) = 14.059, *p*<.001), so post hoc analyses using Dunnett's C were conducted and examined. Aboriginal offenders were significantly younger (M = 35.70, SD = 9.878) than Caucasian offenders (M = 38.64, SD = 11.630), and Unknown offenders (M = 38.57, SD = 12.155), Black offenders (M = 34.99, SD = 9.819) were significantly younger than Caucasian offenders, Other offenders (M = 36.94, SD = 11.054) and Unknown offenders. There was no significant difference between males (M = 36.97, SD = 11.265) and females (M = 36.96, SD = 10.811) on their age at data extraction, *F* (1, 2958) = .001, *p*=.977, (*d* = 0.001, *r* = 0.000).

Table N 2. Mean age of respondents by race with Cohen's d and effect size.

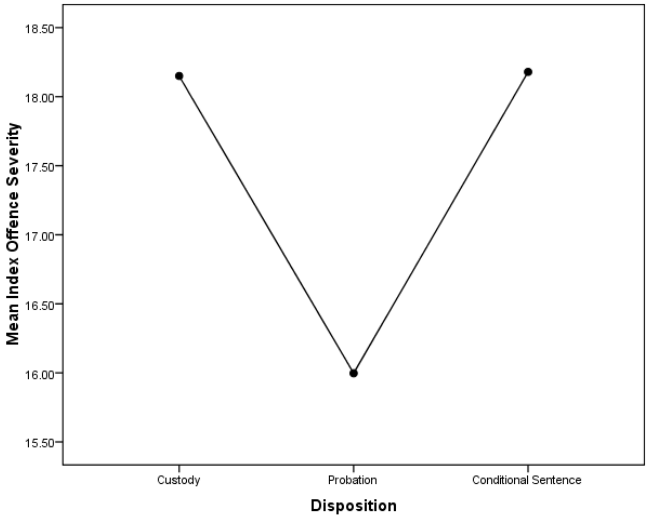
Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	35.70(9.878)	Black	34.99(9.819)	0.072	0.036
Aboriginal	35.70(9.878)	Caucasian	38.64(11.630)	- 0.272	- 0.135
Aboriginal	35.70(9.878)	Other	36.94(11.054)	- 0.118	- 0.059
Aboriginal	35.70(9.878)	Unknown	38.57(12.155)	- 0.259	- 0.128
Black	34.99(9.819)	Caucasian	38.64(11.630)	- 0.339	- 0.167
Black	34.99(9.819)	Other	36.94(11.054)	- 0.187	- 0.093
Black	34.99(9.819)	Unknown	38.57(12.155)	- 0.324	- 0.160
Caucasian	38.64(11.630)	Other	36.94(11.054)	0.150	0.075
Caucasian	38.64(11.630)	Unknown	38.57(12.155)	0.006	0.003
Other	36.94(11.054)	Unknown	38.57(12.155)	- 0.143	- 0.070

Index Offence Severity

Offenders were all given an offence severity rating based on their index offence, called the Offence Severity Score (OSS). The OSS ranges from 1 (unknown) to 26 (homicide). The mean index OSS was in this cohort was 16.63 (SD=3.67) after unknown offences were removed. A one way ANOVA was then conducted with the disposition type as the independent variable and severity of the index offence as the dependent variable. Type of offenders' disposition was significantly related to the offence severity, *F* (2, 2955) = 114.104, *p*<.001). Since the Levene's test was significant, (*F* (2, 2955) = 72.419, *p*<.001) a post hoc analysis was conducted using the Dunnett's C test. This analysis indicated that the offence severity of the index offence of custody offenders (M = 17.15, SD = 4.60) was significantly higher than probation (M = 15.00, SD =

3.25; *d* = 0.540, *r* = 0.261). Probation was also significantly lower than conditional sentence (M = 17.18, SD = 3.76; *d* = - 0.620, *r* = -0.297). There was no significant difference between the offence severity of the custody offenders and the conditional sentence offenders (*d* = - 0.007, *r* = - 0.004).

Figure N 1. Mean index offence severity by disposition.



Internal Consistency of the LSI-OR

Cronbach's alpha was used to measure the internal consistency of the LSI-OR – the degree to which the LSI-OR measures a single construct. The eight subscales were also examined in the same way. Internal reliability can be affected by the number of items in a scale since it is based on the intercorrelation of scale items.

Three items from the LSI-OR are derived (in part, or completely) from other LSI-OR items, therefore, two sets of analyse were conducted. The first included all 43 items, and the second removed three items: early and diverse antisocial behaviour, criminal attitude and pattern of generalized trouble. Analysis revealed strong alpha levels for both the 43 item LSI-OR (*r*=.923) and the 40 item LSI-OR (*r*=.915). These alpha rates, as well as the alpha rates for all of the subscales for the total sample and divided by disposition are displayed in Table N 3.

Table N 3. Alpha scores for total LSI-OR and subcomponents by disposition group

Scale (number of items)	Conditional	Probation	Custodial	All
Overall (43)	.901	.889	.904	.923
Overall (40)	.892	.880	.892	.915
Criminal History (8)	.837	.803	.751	.864
Education / Employment (9)	.827	.846	.784	.836
Family / Marital (4)	.480	.424	.417	.448
Leisure / Recreation (2)	.382	.343	.248	.397
Companions (4)	.619	.609	.546	.634
Procriminal Attitudes (4)	.575	.573	.467	.618
Substance Abuse (8)	.851	.843	.858	.866
Antisocial Pattern (4)	.420	.339	.517	.503

*=<.05, **=<.01, ***=<.001

Table N 4. Alpha scores for total LSI-OR and subcomponents by gender

Scale (number of items)	Males	Females
Overall (43)	. 929	. 913
Overall (40)	.922	.905
Criminal History (8)	.872	.835
Education / Employment (9)	.847	.858
Family / Marital (4)	.427	.454
Leisure / Recreation (2)	.415	.369
Companions (4)	.642	.614
Procriminal Attitudes (4)	.638	.569
Substance Abuse (8)	.859	.869
Antisocial Pattern (4)	.545	.424

Table N 5. Alpha scores for total LSI-OR and subcomponents by Race

Scale (number of items)	Aboriginal	Black	Caucasian	Other	Unknown
Overall (43)	.925	.906	.908	.901	.837
Overall (40)	.916	.896	.898	.892	.826
Criminal History (8)	.863	.844	.856	.836	.707
Education / Employment (9)	.838	.846	.825	.846	.829
Family / Marital (4)	.460	.404	.327	.433	.380
Leisure / Recreation (2)	.379	.435	.380	.319	.388
Companions (4)	.632	.608	.634	.611	.556
Procriminal Attitudes (4)	.681	.615	.572	.563	.530
Substance Abuse (8)	.821	.860	.837	.860	.804
Antisocial Pattern (4)	.584	.409	.495	.364	.206

LSI-OR Total Scores

LSI-OR scores ranged from 0 to 41 with an average of 12.02 (SD = 8.866) across all groups. A 3x4 ANOVA was conducted with disposition type and racial group as independent variables and LSI-OR total score as the dependent variable. There is a significant main effect for

race, F (4, 2960) = 129.123, p<.001, and disposition, F (2, 2960) = 317.150, p<.001. Since Levene's Test was significant, F (14, 2645) = 7.323, p<.001, the Dunnett's C post hoc was performed. LSI-OR scores for each racial category was significantly different than the others. Aboriginal offenders (M = 19.40, SD = 9.62) had the highest LSI-OR scores, followed by Caucasian offenders (M = 12.95, SD = 8.40), Black offenders (M = 11.18, SD = 7.86), Other offenders (M = 9.12, SD = 7.31) and Unknown offenders (M = 7.45, SD = 5.45). Finally, there was also a significant disposition-by-race interaction, F (8, 2960) = 6.212, p <.001. Therefore, the differences in the LSI-OR scores among the three dispositions vary as a function of race.

Figure N 2. Mean index offence severity by disposition.

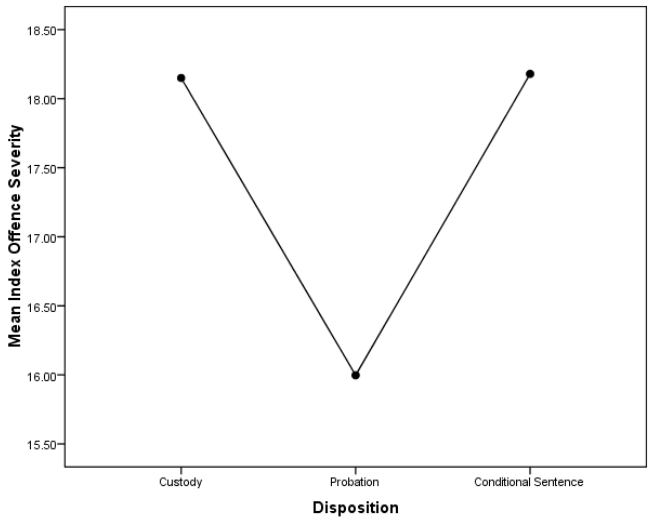


Table N 6. Mean and LSI-OR score by disposition and racial groups

	Custodial(SD)	**Probation(SD)**	**Conditional(SD)**	**Total (SD)**
Aboriginal	29.35(6.470)	15.44(7.733)	17.10(8.313)	19.40(9.624)
Black	20.49(7.147)	9.06(6.431)	11.58(7.754)	11.18(7.857)
Caucasian	23.74(7.527)	11.24(7.190)	10.33(6.221)	12.95(8.401)
Other	19.45(7.868)	7.88(6.396)	9.01(6.448)	9.12(7.309)
Unknown	12.26(6.587)	7.41(5.305)	6.37(5.331)	7.45(5.453)
Total	24.01(8.568)	9.94(7.151)	10.85(7.746)	12.02 (8.866)

Table N 7. Mean and LSI-OR score with Cohen's d and Effect Size by racial groups

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	19.40(9.62)	Black	11.18(7.86)	0.936	0.424
Aboriginal	19.40(9.62)	Caucasian	12.95(8.40)	0.714	0.336
Aboriginal	19.40(9.62)	Other	9.12(7.31)	1.203	0.516
Aboriginal	19.40(9.62)	Unknown	7.45(5.45)	1.528	0.607
Black	11.18(7.86)	Caucasian	12.95(8.40)	-0.218	-0.108
Black	11.18(7.86)	Other	9.12(7.31)	0.271	0.134
Black	11.18(7.86)	Unknown	7.45(5.45)	0.552	0.266
Caucasian	12.95(8.40)	Other	9.12(7.31)	0.486	0.236
Caucasian	12.95(8.40)	Unknown	7.45(5.45)	0.777	0.362
Other	9.12(7.31)	Unknown	7.45(5.45)	0.259	0.128

Table N 8. Mean and LSI-OR score with Cohen's d and Effect Size by racial groups for those on custody

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	29.35(6.470)	Black	20.49(7.147)	1.300	0.545
Aboriginal	29.35(6.470)	Caucasian	23.74(7.527)	0.799	0.371
Aboriginal	29.35(6.470)	Other	19.45(7.868)	1.374	0.566
Aboriginal	29.35(6.470)	Unknown	12.26(6.587)	2.618	0.795
Black	20.49(7.147)	Caucasian	23.74(7.527)	-0.443	-0.216
Black	20.49(7.147)	Other	19.45(7.868)	0.138	0.069
Black	20.49(7.147)	Unknown	12.26(6.587)	1.197	0.514
Caucasian	23.74(7.527)	Other	19.45(7.868)	0.557	0.268
Caucasian	23.74(7.527)	Unknown	12.26(6.587)	1.623	0.630
Other	19.45(7.868)	Unknown	12.26(6.587)	0.991	0.444

Table N 9. Mean and LSI-OR score with Cohen's d and Effect Size by racial groups for those on probation

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	15.44(7.733)	Black	9.06(6.431)	0.897	0.409
Aboriginal	15.44(7.733)	Caucasian	11.24(7.190)	0.563	0.271
Aboriginal	15.44(7.733)	Other	7.88(6.396)	1.065	0.470
Aboriginal	15.44(7.733)	Unknown	7.41(5.305)	1.211	0.518
Black	9.06(6.431)	Caucasian	11.24(7.190)	-0.320	-0.158
Black	9.06(6.431)	Other	7.88(6.396)	0.184	0.092
Black	9.06(6.431)	Unknown	7.41(5.305)	0.280	0.139
Caucasian	11.24(7.190)	Other	7.88(6.396)	0.494	0.240
Caucasian	11.24(7.190)	Unknown	7.41(5.305)	0.606	0.290
Other	7.88(6.396)	Unknown	7.41(5.305)	0.080	0.040

Table N 10. Mean and LSI-OR score with Cohen's d and Effect Size by racial groups on a conditional sentence

Race	Mean (SD)	Race	Mean (SD)	Cohen's *d*	Effect Size *r*
Aboriginal	17.10(8.313)	Black	11.58(7.754)	0.687	0.325
Aboriginal	17.10(8.313)	Caucasian	10.33(6.221)	0.922	0.419
Aboriginal	17.10(8.313)	Other	9.01(6.448)	1.087	0.478
Aboriginal	17.10(8.313)	Unknown	6.37(5.331)	1.537	0.609
Black	11.58(7.754)	Caucasian	10.33(6.221)	0.178	0.089
Black	11.58(7.754)	Other	9.01(6.448)	0.360	0.177
Black	11.58(7.754)	Unknown	6.37(5.331)	0.783	0.365
Caucasian	10.33(6.221)	Other	9.01(6.448)	0.208	0.104
Caucasian	10.33(6.221)	Unknown	6.37(5.331)	0.684	0.323
Other	9.01(6.448)	Unknown	6.37(5.331)	0.446	0.218

LSI-OR and Index Offence Severity

Pearson correlations were conducted between the OSS and the LSI-OR total score. These correlations were separated by race disposition in Table N 11. There was a significant correlation between an offender's LSI-OR score and the rated severity of the index offence (r = .071, p <.001). For the dispositions, there was only a significant negative correlation between total LSI-OR score and OSS for the conditional sample.

Table N 11. Pearson correlations for Offence Severity Score and the LSI-OR total score.

	Custody	Conditional	Probation	Female	Male	Total
Aboriginal	.108	-.036	.042	.111	.224***	.205***
Black	.159	-.106	-.057	.004	.196***	.122*
Caucasian	.036	-.054	-.017	.131*	.006	.062
Other	-.253	-.019	-.013	-.083	.127*	.047
Unknown	-.171	.065	-.008	-.099	.028	-.025
Total	.010	-.093*	-.029	-.006	.115***	.071***

*p=.05, **p=.01, ***p<.001

Violent vs. Non-Violent Index Offences

The Offence Severity Scale was then used to classify the index offences as either violent or non-violent. The offences that were classified as "violent offences" from the OSS were: 26. Homicide and related offences, 25. Serious Violent Offences, 24. Violent sexual offences, 22. Non-violent sexual offences, 20. Weapons offences, 18. Miscellaneous offences against the person, and 16. Assault and related offences. First, a t-test was run to compare the mean LSI-OR score of offenders whose index offence was either violent or non-violent. Levene's test was again found to be non-significant (F = .003, p = .954) so we can assume equal variance. There

was a significant difference between these two groups on their LSI-OR total score, *t* (2958) = 2.084, *p* = .037, indicating that those with a non-violent index offence (M = 11.72, SD = 8.778) had a lower LSI-OR score than those with a violent index offence (M = 12.41, SD = 8.971; *d* = - 0.078, *r* = - 0.039). This was also analyzed by disposition group. Levene's test was non-significant for those on a conditional sentence (F = .968, *p* = .326), and there was a significant difference between violent and non-violent index offences on LSI-OR score, *t* (450) = .027, *p*=.027, indicating that those with a violent index offence had a higher LSI-OR score (*M* = 12.15, *SD* = 8.052) than those with a non-violent index offence (M = 10.35, SD = 7.581; *d* = 0.230, *r* = 0.114). Levene's test was significant for the probation sample, (*F* = 4.649, *p*=.031) and there was no-significant difference in LSI-OR scores for those with a violent and a non-violent index offence, *t* (2067) = .924, *p* = .355. Levene's test was non-significant for those in the custody sample (*F* = 2.931, *p* = .088), and there was no significant difference in LSI-OR score between violent and non-violent, *t* (406) = 1.121, *p* = .263. Table N 12 contains the mean LSI-OR score for violent and non-violent offenders by disposition group.

Table N 12. Mean LSI-OR score for violent and non-violent offenders by disposition

	Non-violent(SD)	**Violent(SD)**	**t-score**	**p-value**	**Cohen's *d***	**Effect Size *r***
Conditional	10.35(7.581)	12.15(8.052)	2.213	.027	- 0.230	- 0.114
Probation	9.81(7.308)	10.10(6.961)	.942	.355	- 0.041	- 0.020
Custodial	23.57(8.110)	24.53(9.081)	1.121	.263	- 0.111	- 0.056
Total	11.72(8.778)	12.41(8.971)	2.084	.037	- 0.078	- 0.039

Male Offenders: Violent vs. Non-Violent Index Offences

Specifically examining the male clients, t-tests were run to compare the mean LSI-OR score of offenders whose index offences were violent or non-violent. Levene's test was not significant (*F* = 1.368, *p* = .242) so we can assume equal variance. Similarly, there is a no significant difference between those with a violent and a non-violent index offence on their LSI-OR total score, *t* (1478) = -1.783, *p* = .075. This was also analyzed by disposition group. For offenders with a conditional sentence, the Levene's test was non-significant (F = 2.395, *p* = .123), and the LSI-OR score for violent offenders did not differ significantly for those convicted of a non-violent offence (*t* (207) = .014, *p* =.989). Levene's test was not significant for the probation sample, (*F* = 1.890, *p* = .169) and there was no significant difference in LSI-OR scores for those with a violent and a non-violent index offence, *t* (939) = -1.426, *p* = .151. Levene's test was significant for those in the custody sample (*F* = 1.930, *p* = .166), and there was no significant difference in LSI-OR score between violent and non-violent, *t* (328) =.200, p=.841.

Table N 13. Mean LSI-OR score for violent and non-violent offenders by disposition for males

	Non-violent(SD)	Violent(SD)	t-score	p-value	Cohen's *d*	Effect Size *r*
Conditional	10.77(8.118)	10.79(7.138)	.014	.989	-0.003	-0.001
Probation	10.33(7.126)	9.67(6.843)	-1.436	.151	0.094	0.047
Custodial	23.79(8.167)	23.98(9.128)	.200	.841	-0.022	-0.011
Total	13.64(9.472)	12.74(9.374)	-1.783	.075	0.096	0.048

Female Offenders: Violent vs. Non-Violent Index Offences

Specifically examining the female clients, a t-test was run to compare the mean LSI-OR score of offenders who index offence was violent and non-violent. Levene's test was not significant (F = 1.132, p = .288). There was a significant difference between these two groups on their LSI-OR total score, t (1478) = 3.868, p <.001. This was further broken down by disposition group. Levene's test was significant for those on a condition sentence (F =6.226, p = .013), and there was a significant difference between violent and non-violent index offences on LSI-OR score, t (79.932) = 2.911, p = .005. Violent offenders with a custodial sentence were significantly different from non-violent offenders with a custodial sentence (t (76) = 2.351, p=.021), the Levene's test was not significant here, F=.266, P=.608. Violent offenders with probation did not differ significantly on LSI-OR score from non-violent offenders with probation (t (1157) = .2.490, p = .013).

Table N 14. Mean LSI-OR score for female violent and non-violent offenders by disposition

	Non-violent(SD)	Violent(SD)	t-score	p-value	Cohen's *d*	Effect Size *r*
Conditional	10.03(7.149)	13.75(8.804)	2.911	.005	-0.464	-0.226
Probation	9.51(7.401)	10.60(7.073)	2.490	.013	-0.151	-0.075
Custodial	22.74(7.917)	27.16(8.501)	2.351	.021	-0.538	-0.260
Total	10.25(7.894)	11.94(8.360)	3.868	<.001	-0.208	-0.103

Recidivism

The overall recidivism rate, as defined by any reconviction, was 31.3% (N=927). However, rates varied according to disposition group. A 3x4 ANOVA was conducted with Disposition and Race as independent factors and Recidivism (yes, no) as the dependent factor. Levene's test was significant, F (14, 2945) = 79.185, p <.001. There was a significant main effect for Disposition, F (2, 2960) = 49.918, p <.001. Since Levene's Test was significant, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate (63.73%) than those placed on probation (26.33%) and those placed on a conditional sentence (25.22%). There was no significant difference on the

recidivism rate of those on probation or on a conditional sentence. There was also a significant main effect for race, F (4, 2960) = 36.663, p <.001. When looking into the simple main effects for Race, the Dunnett's C post hoc was again used. Aboriginal offenders were found to recidiviate (50.34%) more than Black (39.86%), Caucasian (34.46%), Other (22.47%) and Unknown (9.46%) offenders. Black offenders recidivated more than Other and Unknown offenders. Caucasian offenders recidivated more than Other and Unknown offenders and Other offenders recidivated more than Unknown offenders. Finally, there was also a significant disposition-by-race interaction, F (8, 2960) = 1.97, p=.046, therefore, the differences in the rates of recidivism among the three dispositions varies as a function of Race.

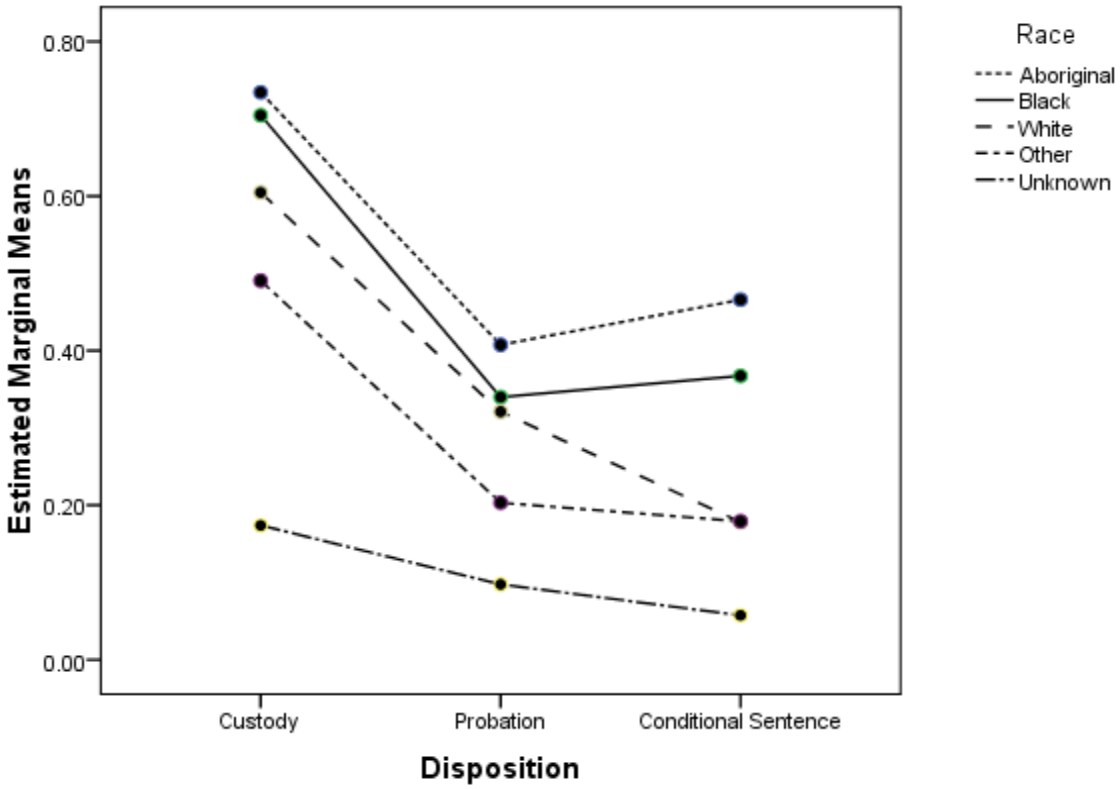
The Univariate tests showed that there was a significant difference among dispositions for Aboriginal offenders, F (2, 592) = 25.327, p <.001, Black offenders, F (2,592) = 21.681, p <.001, Caucasian offenders, F (2, 592) = 18.944, p <.001, Other offenders, F (2, 592) = 12.395, p <.001, and there was no significant difference for Unknown offenders, F (2, 592) = 1.569, p=.209. Similarly, there was also a significant difference of Races for custodial sentences, F (4, 408) = 9.405, p<.001, probation, F (4, 2100) = 35.459, p <.001, and for conditional sentences, F (4, 452) = 14.153, p <.001.

Aboriginal offenders in custody reoffended (73.42%) significantly more than Black (70.45%), Caucasian (60.47%), Other (49.06%) and Unknown (17.39%) offenders. Black offenders recidivated significantly more than Other and Unknown offenders, Caucasian offenders reoffended more than Other and Unknown offenders, and Other offenders reoffended significantly more than Unknown offenders.

When examining those on probation, Aboriginal offenders offended (40.75%) significantly more than Black (33.99%), Caucasian (32.10%), Other (20.32%) and Unknown (9.75%) offenders. Black offenders recidivated significantly more than Caucasian, Other and Unknown offenders, Caucasian offenders reoffended more than Other and Unknown offenders, and Other offenders reoffended significantly more than Unknown offenders.

For those on a conditional sentence, Aboriginal offenders recidivated (46.59%) more than Caucasian (17.81%), Other (17.92%) and Unknown (5.75%) offenders. Black offenders recidivated (36.73%) more than Caucasian, "Other" and Unknown offenders, and "Other" offenders recidivated more than Unknown offenders.

Figure N 3. Mean recidivism rate separated by race and disposition.



Offence Severity: Index vs. Recidivism

A Pearson Correlation was conducted between the severity of the index offence and the severity of a reoffence if a reoffence was recorded. Overall, there was a positive relationship between the severity of the index offence and the severity of reoffence (r = .096, p = .003). There was no significant correlation for conditional sentence offenders (r = .064, p = .500), probation offenders (r = .045, p = .291), but a significant correlation for custodial offenders (r = .144, p = .021). There was a significant correlation when looking at the entire male sample, (r = .129, p = .003), and male custody (r=.169, p=.014). Male conditional sentence (r = .047, p = .727) and male probation were not significant (r = .063, p = .297). There was no significant correlations for all female groups, all females (r = .028, p = .583), female conditional sentence, (r = .126, p = .360), female probation (r = .023, p = .705), and female custody (r = -.047, p = .752).

Survival Analyses

A Kaplan-Meier Survival analysis was conducted on all offenders. The follow-up period extended to five years from the day custodial offenders were released from custody or the day conditional and probation offenders completed community supervision; therefore offenders were censored when they had completed 1825 days (five years) of follow-up. Across all disposition groups, 68.7% (N = 2033) of the sample was censored, indicating that 31.3% of the offenders recidivated within five years. The mean survival time (time to recidivate) for those who reoffended was 588.66 days (SE = 14.00, SD = 426.278).

Survival Analyses - Disposition

A second Kaplan-Meier survival analysis was performed with the sample broken into disposition groups. A smaller proportion of those with a conditional sentence recidivated (censor rate = 74.8%) than offenders with a probation sentence (censor rate = 73.7%) and a custodial sentence (censor rate = 36.3%). Probation offenders had the greatest mean survival rate (644.18 days, SE = 17.89, SD = 420.61), followed by those on a conditional sentence (619.61 days, SE = 42.12, SD=449.716), and finally, the custodial sample had the lowest mean survival rate (456.99 days, SE = 24.805, SD = 399.97). A one-way analysis of variance (ANOVA) with the survival time of reoffending offenders as the dependent variable and disposition as the independent variable showed a significant difference in the mean survival time between disposition groups (F (2,924) = 18.034, p <.001).

Figure N 4. Mean days to reoffence if a reoffence was recorded, by disposition.

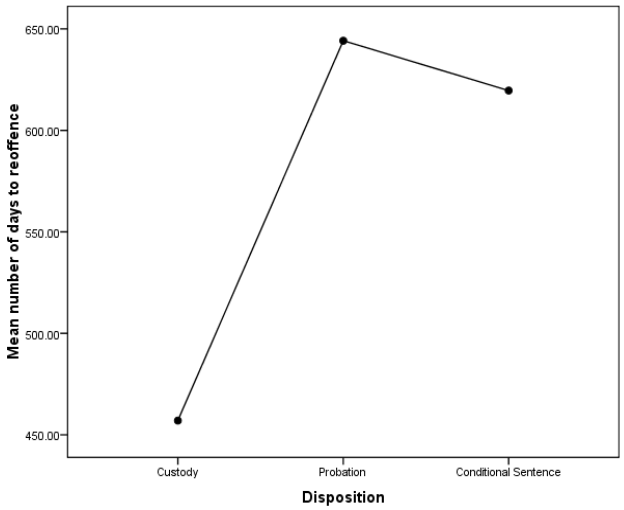
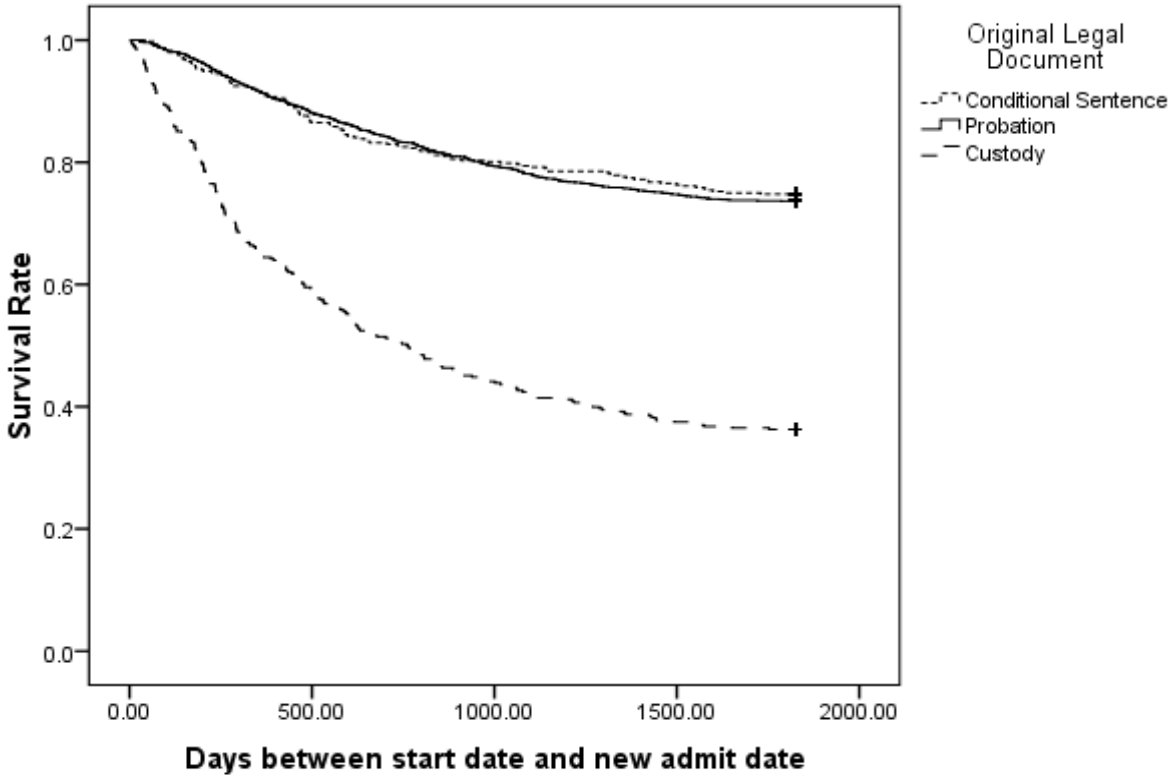


Table N 15. Mean (SD) survival days by disposition with Cohen's d and effect size

Disposition	**Mean (SD)**	**Disposition**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Conditional Sentence	619.61(449.72)	Probation	644.18(420.61)	-0.056	-0.028
Conditional Sentence	619.61(449.72)	Custody	456.99(399.97)	0.382	0.188
Probation	644.18(420.61)	Custody	456.99(399.97)	0.456	0.222

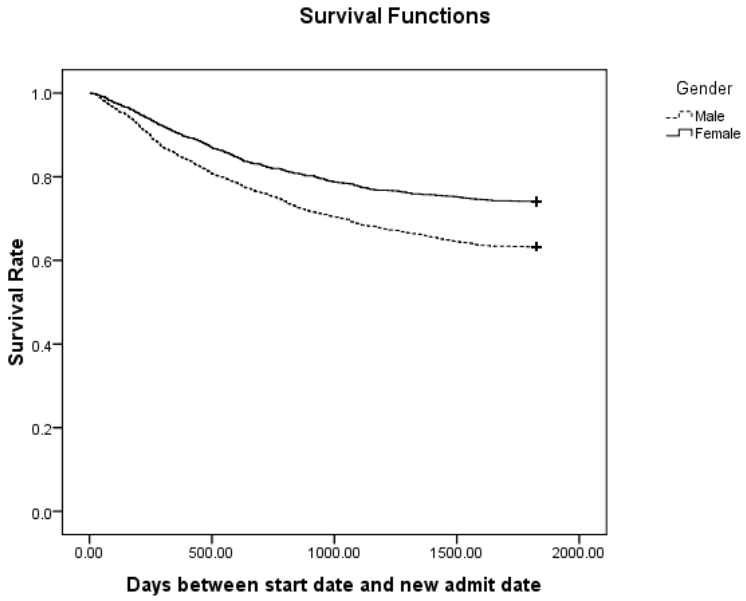
Figure N 5. Displays the survival curve separated by disposition.



Survival Analyses - Gender

A third Kaplan-Meier survival analysis was performed with the sample broken into gender groups. A smaller proportion of females (censor rate = 74.1%) recidivated than males (censor rate = 63.2%). Female offenders had the greatest mean survival rate (590.86 days, SE = 21.33, SD = 417.52), followed by males (587.11 days, SE = 18.55, SD = 432.71; d = 0.009, r = 0.004).

Figure N 6. Displays the survival curve for all offenders by gender.



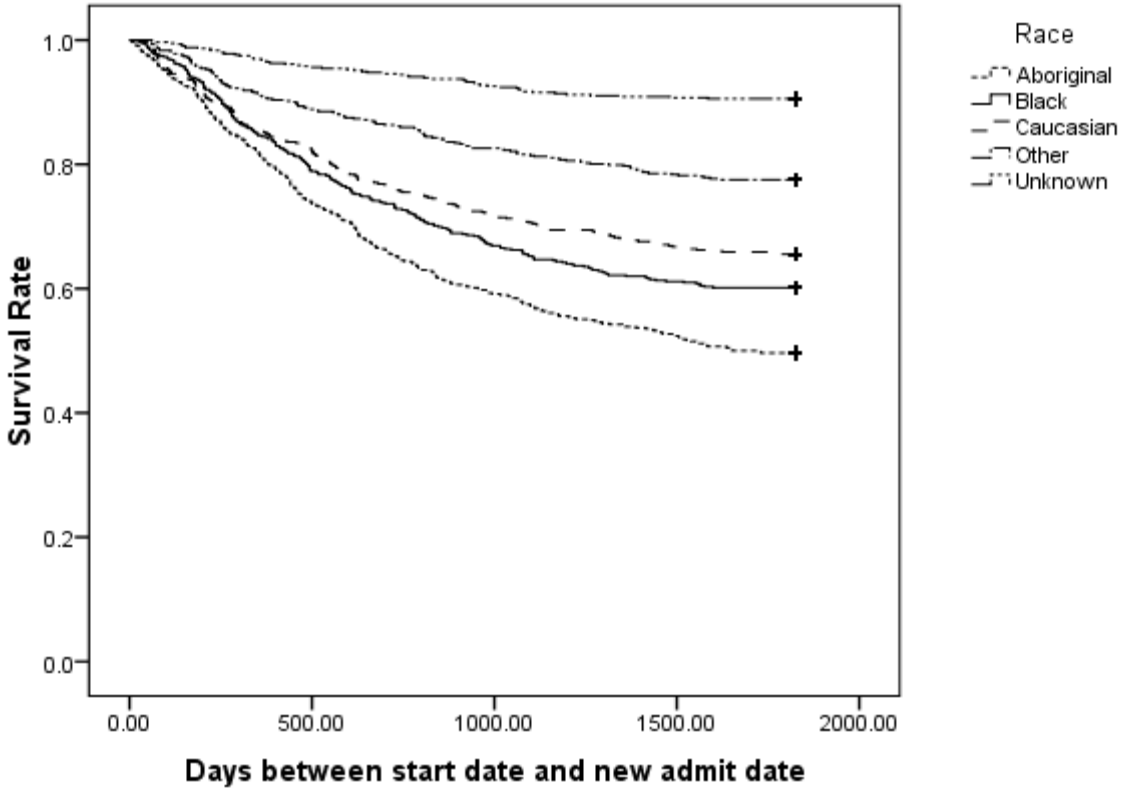
Survival Analyses - Race

A fifth Kaplan-Meier survival analysis was performed with the sample broken into racial groups. A smaller proportion of unknown race category (censor rate = 90.5%) recidivated than the other group (censor rate = 77.5%), the Caucasian group (censor rate = 65.5%), the Black group (60.1%) and the Aboriginal group (49.7%). Mean survival days for Caucasian offenders (566.79 days, SE=30.62, SD=437.31) was the lowest, followed by Black (577 days, SE=26.06, SD=400.30), Aboriginal (589 days, SE = 25.27, SD = 436.19), Other (618 days, SE=38.53, SD=444.38), and Unknown offenders (639 days, SE=53.53, SD=400.58).

Table N 16. Mean survival days broken down by race with Cohen's d and effect size

Race	Mean (SD)	Race	Mean (SD)	Cohen's *d*	Effect Size *r*
Aboriginal	589(436.19)	Black	577(400.30)	0.029	0.014
Aboriginal	589(436.19)	Caucasian	566(437.31)	0.053	0.026
Aboriginal	589(436.19)	Other	618(444.38)	-0.066	-0.033
Aboriginal	589(436.19)	Unknown	639(400.58)	-0.119	-0.060
Black	577(400.30)	Caucasian	566(437.31)	0.026	0.013
Black	577(400.30)	Other	618(444.38)	-0.097	-0.048
Black	577(400.30)	Unknown	639(400.58)	-0.155	-0.077
Caucasian	566(437.31)	Other	618(444.38)	-0.118	-0.059
Caucasian	566(437.31)	Unknown	639(400.58)	-0.174	-0.087
Other	618(444.38)	Unknown	639(400.58)	-0.050	-0.025

Figure N 7. Displays the survival curve for all offenders by race



Survival Analyses –Male Race

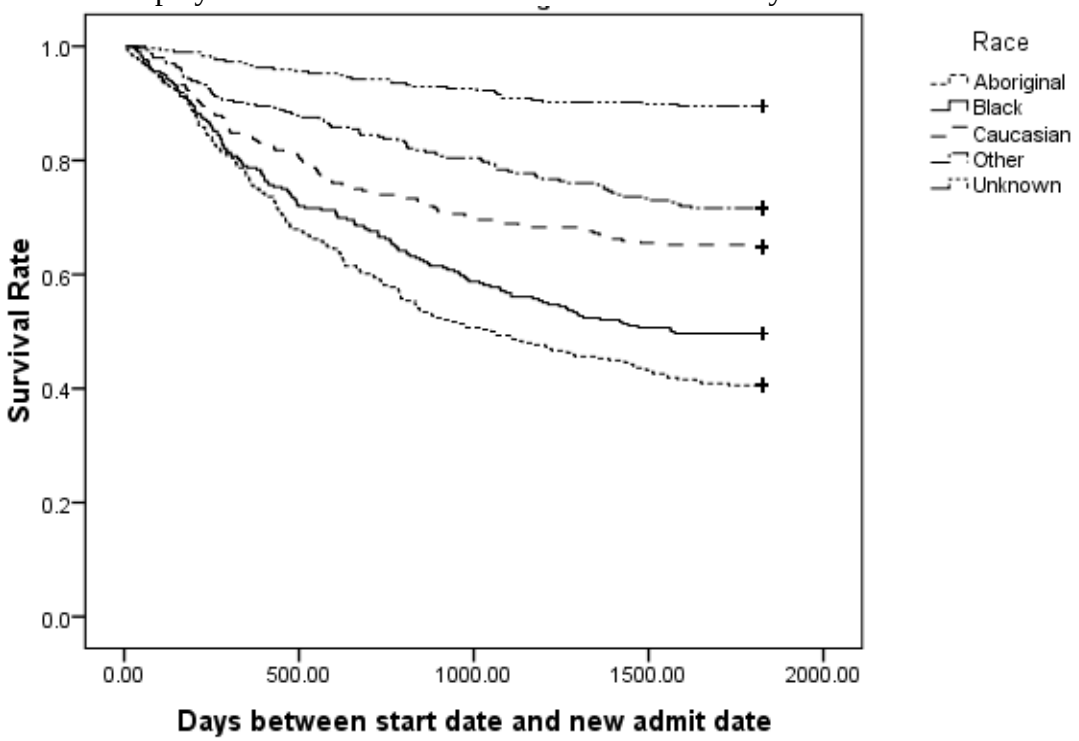
A sixth Kaplan-Meier survival analysis was performed with the male sample broken into racial groups. A smaller proportion of unknown race category (censor rate=89.5%) recidivated than the Other males (censor rate=71.6%), Caucasian males (censor rate=64.9%), Black males (censor rate=39.7%) and Aboriginal males (censor rate=40.5%). Other males had the highest mean survival rate (686 days, SE=52.35, SD=479.83), followed by Unknown males (670 days,

SE=74.61, SD=415.39), Aboriginal males (575 days, SE=32.25, SD=427.86), Black males (572 days, SE=34.21, SD=417.60), and Caucasian males (525 days, SE=41.04, SD=418.54).

Table N 17. Mean survival days broken down by race with Cohen's d and effect size

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	575(427.86)	Black	572(417.60)	0.007	0.004
Aboriginal	575(427.86)	Caucasian	525(418.54)	0.118	0.059
Aboriginal	575(427.86)	Other	686(479.83)	-0.244	-0.121
Aboriginal	575(427.86)	Unknown	670(415.39)	-0.225	-0.112
Black	572(417.60)	Caucasian	525(418.54)	0.112	0.056
Black	572(417.60)	Other	686(479.83)	-0.253	-0.126
Black	572(417.60)	Unknown	670(415.39)	-0.235	-0.117
Caucasian	525(418.54)	Other	686(479.83)	-0.358	-0.176
Caucasian	525(418.54)	Unknown	670(415.39)	-0.348	-0.171
Other	686(479.83)	Unknown	670(415.39)	0.036	0.018

Figure N 8. Displays the survival curve for all male offenders by race



Survival Analyses –Female Race

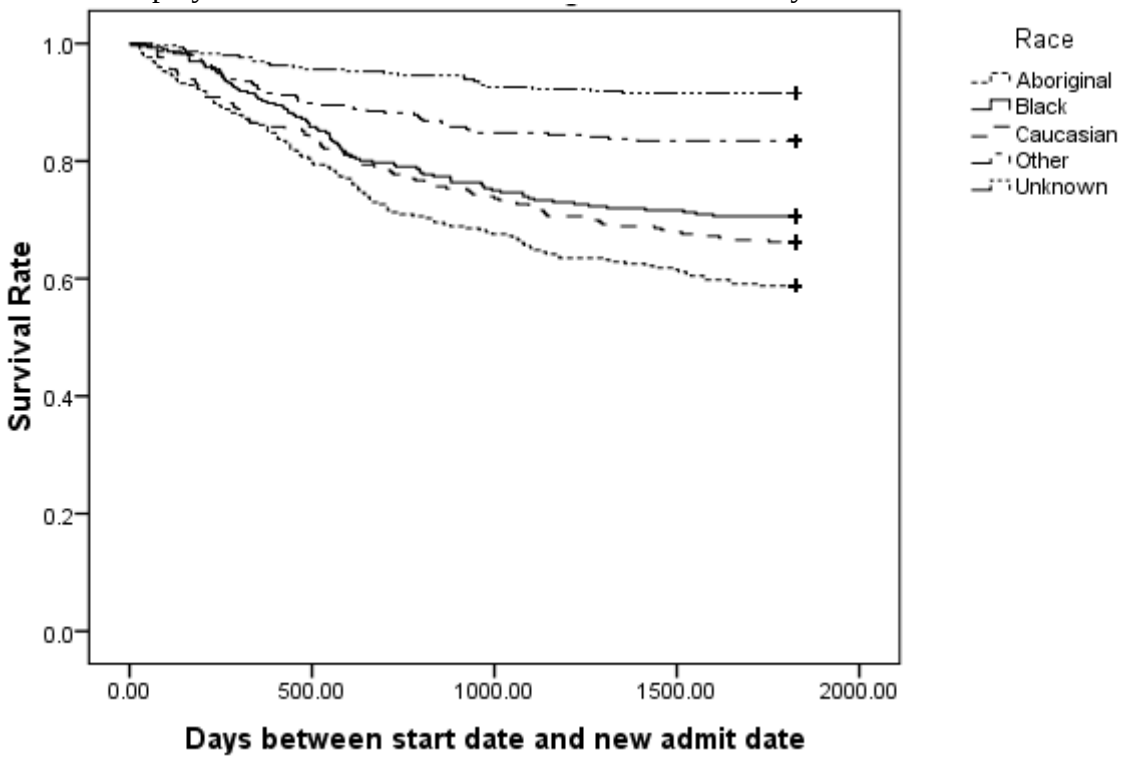
A seventh Kaplan-Meier survival analysis was performed with the female sample broken into racial groups. A smaller proportion of unknown race recidivated (censor rate = 91.6%) than the Other race (censor rate = 83.4%), Black females (censor rate = 70.6%), Caucasian females (censor rate = 66.2%), and Aboriginal females (censor rate = 58.8%). Aboriginal females (610

days, SE = 40.64, SD = 448.92) and Caucasian females (610 days, SE = 45.40, SD = 454.00) had the largest mean survival days, followed by Unknown females (601 days, SE = 77.27, SD = 386.33), Black females (588 days, SE = 39.77, SD = 370.91), and Other females (503 days, SE = 50.18, SD = 351.25).

Table N 18. Mean survival days broken down by race with Cohen's d and effect size for females

Race	**Mean (SD)**	**Race**	**Mean (SD)**	**Cohen's *d***	**Effect Size *r***
Aboriginal	610(448.92)	Black	588(370.91)	0.053	0.027
Aboriginal	610(448.92)	Caucasian	610(454.00)	0.000	0.000
Aboriginal	610(448.92)	Other	503(351.25)	0.265	0.132
Aboriginal	610(448.92)	Unknown	601(386.33)	0.021	0.011
Black	588(370.91)	Caucasian	610(454.00)	-0.053	-0.027
Black	588(370.91)	Other	503(351.25)	0.235	0.117
Black	588(370.91)	Unknown	601(386.33)	-0.034	-0.017
Caucasian	610(454.00)	Other	503(351.25)	0.264	0.131
Caucasian	610(454.00)	Unknown	601(386.33)	0.021	0.011
Other	503(351.25)	Unknown	601(386.33)	-0.265	-0.132

Figure N 9. Displays the survival curve for all female offenders by race



The LSI-OR and Recidivists vs. Non-Recidivists

In order to compare the LSI-OR's ability to distinguish recidivists from non-recidivists, a number of t-tests were run. This was examined for gender, disposition and race. When examining the whole sample, the average LSI-OR score of the recidivists was higher than that of the non-recidivists, t (1493) = 25.370, p <.001. The LSI-OR score of recidivists was also higher than the non-recidivists for custody, t (250.502) = 6.678, p <.001, probation, t (860.826) = 16.539, p <.001, and conditional, t (164.681) = 9.981, p <.001. Similarly, this was also true for Aboriginal offenders, t (590) = 8.756, p <.001, Black offenders, t (422.737) = 12.835, p <.001, Caucasian offenders, t (351.973) = 10.894, p <.001, Other offenders, t (183.809) = 7.799, p <.001, and Unknown offenders, t (590) = 6.555, p<.001.

Table N 19. LSI-OR scores between non-recidivists and recidivists by disposition

	Non-Recidivists	**Recidivists**	**t-score**	**p-value**	**Cohen's *d***	**Effect Size *r***
Conditional	8.76(6.432)	17.04(8.025)	9.981	<.001	-1.139	-0.495
Probation	8.40(6.380)	14.26(7.420)	16.539	<.001	-0.847	-0.390
Custodial	20.22(9.312)	26.16(7.302)	6.678	<.001	-0.710	-0.334
Total	9.32(7.312)	17.94(9.096)	25.370	<.001	-1.045	-0.463

Table N 20. LSI-OR scores between non-recidivists and recidivists by racial group

	Non-Recidivists	**Recidivists**	**t-score**	**p-value**	**Cohen's *d***	**Effect Size *r***
Aboriginal	16.12(8.949)	22.64(9.172)	8.756	<.001	-0.720	-0.339
Black	8.08(6.187)	15.85(7.811)	12.835	<.001	-1.103	-0.483
Caucasian	10.34(7.061)	17.92(8.521)	10.894	<.001	-0.969	-0.436
Other	7.78(6.484)	13.74(8.096)	7.799	<.001	-0.813	-0.376
Unknown	6.99(5.207)	11.84(5.833)	6.555	<.001	-0.877	-0.402

Table N 21. LSI-OR scores between non-recidivists and recidivists by gender

	Non-Recidivists	**Recidivists**	**t-score**	**p-value**	**Cohen's *d***	**Effect Size *r***
Male	9.81(7.677)	18.99(9.344)	19.427	<.001	-1.074	-0.473
Female	8.90(6.962)	16.45(8.526)	15.614	<.001	-0.970	-0.436

LSI-OR and Recidivism

For the purposes of examining the LSI-OR's ability at predicting general recidivism, non-recidivists were assigned the value of 0 and recidivists were assigned the value of 1. First, there was a positive correlation between LSI-OR total score and recidivism (r = .451, p < .001), indicating that those with a higher LSI-OR score were more likely to recidivate. This was also true when broken down by disposition.

Table N 22. Correlations between LSI-OR total scores and recidivism by disposition

	Whole Sample (n=2960)	**Conditional (n=452)**	**Probation (n=2100)**	**Custodial (n=408)**
Total Section A	.451***	.464***	.361***	.334***
Total Strengths	-.109***	-.104*	-.072***	-.098*
Criminal History	.434***	.493***	.301***	.410***
Education/Employment	.317***	.290***	.242***	.226***
Family/Marital	.198***	.199***	.145***	.158***
Leisure/Recreation	.245***	.202***	.171***	.130**
Companions	.314***	.287***	.243***	.213***
Procriminal Attitudes	.251***	.203***	.167***	.099*
Substance Abuse	.327***	.288***	.252***	.229***
Antisocial Patterns	.331***	.313***	.220***	.255***
Total Section B	.341***	.412***	.204***	.230***
Personal Problems	.331***	.374***	.205***	.235***
Perpetration History	.254***	.319***	.110***	.159***
Total Section C	.277***	.186***	.101***	.228***
Total Section F	.218***	.146**	.137***	.157**
Social, Health, Mental Health	.196***	.139**	.134***	.138**
Barrier to Release	.248***	.133**	.091***	.147**
Total Section G	.221***	.129**	.142***	.142**

*=<.05, **=<.01, ***=<.001

Table N 23. Correlations between LSI-OR total scores and recidivism by disposition

	Male (n=1480)	**Female (n=1480)**
Total Section A	.470***	.408***
Total Strengths	-.117***	-.087***
Criminal History	.462***	.366***
Education/Employment	.351***	.286***
Family/Marital	.234***	.192***
Leisure/Recreation	.286***	.180***
Companions	.330***	.278***
Procriminal Attitudes	.270***	.196***
Substance Abuse	.317***	.316***
Antisocial Patterns	.355***	.277***
Total Section B	.346***	.297***
Personal Problems	.335***	.294***
Perpetration History	.267***	.191***
Total Section C	.300	.208***
Total Section F	.257***	.220***
Social, Health, Mental Health	.232***	.209***
Barrier to Release	.257***	.206***
Total Section G	.226***	.183***

*=<.05, **=<.01, ***=<.001

Table N 24. Correlations between LSI-OR total scores and recidivism by race

	Aboriginal (n=592)	**Black (n=592)**	**Caucasian (n=592)**	**Other (n=592)**	**Unknown (n=592)**
Total Section A	.339***	.484***	.429**	.341***	.261***
Total Strengths	-.163***	-.120**	-.137***	.005	-.056
Criminal History	.369***	.449***	.348***	.338***	.156***
Education/Employment	.213***	.333***	.309***	.210***	.194***
Family/Marital	.101*	.176***	.168***	.107**	.097*
Leisure/Recreation	.182***	.258***	.230***	.209***	.134**
Companions	.216***	.310***	.301***	.204***	.170***
Procriminal Attitudes	.210***	.234***	.240***	.221***	.030
Substance Abuse	.266***	.331***	.305***	.217***	.179***
Antisocial Patterns	.270***	.335***	.322***	.219***	.117**
Total Section B	.289***	.322***	.298***	.252***	.081*
Personal Problems	.315***	.317***	.293***	.229***	.092*
Perpetration History	.179***	.208***	.201***	.195***	.021
Total Section C	.258***	.242***	.256***	.129**	.185***
Total Section F	.150***	.230***	.193***	.183***	.055
Social, Health, Mental Health	.123**	.216***	.168***	.166***	.058
Barrier to Release	.240***	.173***	.250***	.189***	-.035
Total Section G	.227***	.223***	.219***	.090*	.067

*=<.05, **=<.01, ***=<.001

Receiver Operating Characteristic Analysis

The number of true predictions was weighed against the number of false predictions using ROC analysis and reported using the area under the curve. The AUC by racial group is presented in Table N 25 AUC by disposition group in Table N 26.

Table N 25. AUC for gender by race

	Aboriginal	**Black**	**Caucasian**	**Other**	**Unknown**
Male	.692(.631-.752)	.795(.744-.845)	.749(.691-.807)	.732(.667-.797)	.750(.670-.830)
Female	.675(.614-.737)	.747(.685-.808)	.760(.700-.820)	.720(.644-.797)	.738(.639-.837)
Total	.695(.653-.737)	.785(.748-.822)	.756(.714-.797)	.728(.679-.777)	.744(.681-.806)

Table N 26. AUC by gender and disposition

	Conditional Sentence	**Probation**	**Custody**
Male	.804(.738-.871)	.735(.701-.769)	.690(.630-.751)
Female	.786(.721-.851)	.735(.701-.768)	.668(.530-.805)
Total	.795(.749-.841)	.734(.710-.758)	.686(.631-.742)

LSI-OR and Violent Recidivism

In order to determine the relationship between LSI-OR scores and violent recidivism, correlation analyses were conducted with LSI-OR score and its subscales as one factor and

violent recidivism as the other factor. Violent recidivists were coded with a 1 and all other cases were coded with 0. In this situation, a positive relationship would suggest that as LSI-OR scores increase, so does the likelihood of committing a violent reoffence. Correlations between LSI-OR total score, subscales and violent recidivism by disposition group can be found in Table N 27, by race in Table N 28 and by gender in Table N 29.

Table N 27. Correlation with violent recidivism by disposition group

	Whole Sample (n=2960)	**Conditional (n=452)**	**Probation (n=2100)**	**Custodial (n=408)**
Total Section A	.243***	.341***	.162***	.146**
Total Strengths	-.070***	-.104***	-.035	-.087
Criminal History	.253***	.354***	.151***	.206***
Education/Employment	.188***	.235***	.138***	.099*
Family/Marital	.110***	.147**	.070**	.075
Leisure/Recreation	.131***	.137***	.068*	.114*
Companions	.184***	.261***	123***	.092
Procriminal Attitudes	.120***	.161**	.061**	-.011
Substance Abuse	.134***	.151***	.060**	.090
Antisocial Patterns	.188***	.277***	.098***	.110*
Total Section B	.124***	.219***	.013	.015
Personal Problems	.146***	.253***	.041	.067
Perpetration History	.055**	.104*	-.038	-.054
Total Section C	.166***	.151***	.040	.129**
Total Section F	.137***	.058	.098***	.090
Social, Health, Mental Health	.123***	.054	.095***	.078
Barrier to Release	.156***	.064	.078***	.090
Total Section G	.098***	.065	.068**	-.030

*=<.05, **=<.01, ***=<.001

Table N 28. Correlation with violent recidivism by race

	Aboriginal (n=592)	**Black (n=592)**	**Caucasian (n=592)**	**Other (n=592)**	**Unknown (n=592)**
Total Section A	.190***	.301***	.276***	.191***	.203***
Total Strengths	-.100**	-.064	-.058	-.001	-.062
Criminal History	.252***	.287***	.199***	.201***	.161***
Education/Employment	.133**	.189***	.275***	.121***	.152***
Family/Marital	.073	.111**	.112**	.085*	.096*
Leisure/Recreation	.119***	.135**	.161***	.078	.069
Companions	.135**	.233***	.197***	.108**	.111**
Procriminal Attitudes	.078	.161***	.084*	.128**	-.007
Substance Abuse	.073*	.193***	.168***	.092*	.162***
Antisocial Patterns	.181***	.228***	.182***	.158***	.019
Total Section B	.139**	.121**	.110**	.058	.028
Personal Problems	.142**	.148***	.150***	.090*	.060
Perpetration History	.099*	.033	.014	-.022	-.046
Total Section C	.188***	.167***	.179***	.041	.116***
Total Section F	.109**	.119**	.182***	.171***	.095*
Social, Health, Mental Health	.098*	.104*	.159***	.154***	.097*
Barrier to Release	.111**	.145***	.237***	.196***	-.024
Total Section G	.085*	.094*	.172***	.083*	-.020

*=<.05, **=<.01, ***=<.001

Table N 29. Correlation with violent recidivism by gender

	Male (n=1480)	**Female (n=1480)**
Total Section A	.281***	.213***
Total Strengths	-.087**	-.059*
Criminal History	.287***	.240***
Education/Employment	.231***	.146***
Family/Marital	.125***	.094***
Leisure/Recreation	.174***	.094***
Companions	.221***	.152***
Procriminal Attitudes	.141***	.107***
Substance Abuse	.159***	.116***
Antisocial Patterns	.217***	.165***
Total Section B	.142***	.122***
Personal Problems	.163***	.141***
Perpetration History	.072**	.047***
Total Section C	.204***	.143***
Total Section F	.160***	.115***
Social, Health, Mental Health	.140***	.107***
Barrier to Release	.188***	.136***
Total Section G	.100***	.106***

Appendix O

Table O 1. Coulson level comparisons between the Female Coulson from Appendix M and Brews (2009)

	Entire Sample	**Custodial**	**Conditional**	**Probation**
Correlation (r)				
Female Coulson	.397	.317	.423	.353
Brews	.447	.254	.328	.343
Area Under Curve				
Female Coulson	.752	.689	.770	.727
Brews	.788	.642	.779	.737

Table O 2. Coulson level comparisons between the Female Coulson from Appendix M and Brews (2009)

	Aboriginal	**Black**	**Caucasian**
Correlation (r)			
Female Coulson	.294	.400	.401
Brews	.385	.517	.415
Area Under Curve			
Female Coulson	.670	.742	.746
Brews	.721	.807	.754